Coal Age

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OCTOBER, 1956
A McGRAW-HILL PUBLICATION — PRICE 50c

The Gibraltar Story . . . p 60

"IN CASE OF EMERGENCY"

Mine emergencies happen without warning . . . and when they do happen, equipment that carries the "in case of emergency" label suddenly becomes vital to fire fighting and rescue efforts. Breathing protection devices are a major part of emergency mine equipment.

Below is a check list of this equipment offered by MSA. If you would like to make sure your emergency program is up-to-date, why not have our representative check your requirements and suggest a regular inspection and maintenance schedule.

M-S-A McCAA® Oxygen Breathing Apparatus—
gives complete breathing protection in any unbreathable atmosphere for a minimum of two hours. Used under the hardest physical conditions . . . in fighting and sealing fires, re-establishing ventilation, and rescue operations. U. S. Bureau of Mines approved.

M-S-A Chemox®—
allows complete breathing protection in any gaseous or oxygen deficient area for a minimum of 45 minutes. Generates its own oxygen supply from replaceable canister. Weighs only 13½ lbs. U. S. Bureau of Mines approved.

M-S-A All-Service Mask®—
assures safe, comfortable breathing protection against smoke and toxic gases including carbon monoxide—singly—or in combination where there is sufficient oxygen to sustain life. U. S. Bureau of Mines approved.

M-S-A Self-Rescuer®—
a miniature mask for use in deadly carbon monoxide following fire or explosion. Gives the miner precious minutes of emergency breathing protection. Unit is compact, lightweight; may be stored in quantity underground or carried individually. U. S. Bureau of Mines approved.

M-S-A Air and O_2 Mask—
designed for 30 minutes maximum breathing protection in any atmosphere—supplies air or oxygen in exact accordance with breathing requirements. Flow ceases during exhalation for added economy. Comfortable to wear and easy to use.

M-S-A Pneolator®—
provides automatic artificial respiration that assures maximum chances of recovery for victims of poisonous gases, electrical shock, heart attacks, or other causes of asphyxia. Housed in compact, lightweight glass fiber case.

MSA
SAFETY EQUIPMENT HEADQUARTERS

MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue, Pittsburgh 8, Pa.
At Your Service: 77 Branch Offices in the United States and Mexico

MINE SAFETY APPLIANCES CO. OF CANADA, LTD.
Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, Sydney, N.S.

B.F.Goodrich

Belt shovels 1100 tons of coal an hour

It takes hundreds of tons of coal an hour to feed the boilers in this Ohio Valley power plant. But it's a long, steep climb from the storage pile up to the bunkers, so an unusually strong conveyor belt was needed.

B. F. Goodrich engineers recommended a belt made with B. F. Goodrich Nyfil fabrics. In this belt, nylon is used as cross threads in the fabric to give extra strength without adding weight. Use of nylon increases flexibility, so belt troughs perfectly whether empty, lightly or fully loaded. Belts made with Nyfil fabrics hold fasteners better, have greater impact resistance, can carry heavier loads farther, higher, than belts made with all-cotton fabrics, yet these longer-lasting belts cost no more.

As a safety measure, B. F. Goodrich built this belt with a new fire-resisting rubber which will not support combustion or spread fire. B. F. Goodrich belts, made with this rubber, have been accepted for listing as fire resistant by the Bureau of Mines. This special rubber also has high resistance to impact, abrasion, oil, grease, tearing, gouging and even mildew attack. So belts made with it can be expected to equal or surpass the long service records made by other B. F. Goodrich coal-handling belts.

Before you buy another conveyor belt, look into the cost-saving advantages you get with a belt made with Nyfil fabrics, and the safety you can get with B. F. Goodrich fire-resisting rubber. Your B. F. Goodrich distributor can give you full details, or write *B. F. Goodrich Industrial Products Co., Dept. M-688, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

Hulburt

SOMETHING HAS BEEN ADDED

A ONE POUND THROW-A-WAY GREASE CARTRIDGE

5 QUESTIONS TO ASK YOURSELF

When you buy equipment to take the water out of your washed fine coal

1 How DRY? Bird Coal Filter discharge of any given size distribution will be as dry as that from any other mechanical dewatering equipment or combination of equipments.

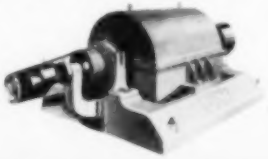
2 How MUCH? The Bird delivers up to a ton or more per minute. It is built in sizes to meet your capacity needs.

3 How EFFICIENT? The Bird can recover all the fine coal. High ash fines may be automatically removed from the coal as and when desired.

4 How TROUBLE-FREE? The Bird, and *only* the Bird, does the complete job, without supplemental or additional equipment. It handles feeds of any flowable consistency. Dilute feeds offer no problem. It runs continuously, month after month, without shutdowns for overhaul or parts replacements.

5 How ECONOMICAL? The Bird gets your fine coal dry at lowest overall cost per ton and per year. Operating cost is not over five or six cents per ton. Maintenance cost is a penny or less per ton.

The Bird Coal Filter may be the right answer for *you*, whether you wash 100 tons or less per hour — 2000 tons or more. Why not find out?



BIRD
MACHINE COMPANY

LEADING AUTHORITY ON SOLIDS-LIQUIDS SEPARATIONS
Builders of
SOLIDS-LIQUIDS SEPARATING EQUIPMENT
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Regional Offices: Evanston, Illinois • Portland, Oregon

Coal Age

OCTOBER • 1956

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In this issue . . .

• What goes into developing a new high-tonnage mine on water transportation? The answer to this question at one property is found in the description of the new Gibraltar mine, beginning on p 60 (cover). Gibraltar uses the latest in mining, preparation and electrical equipment to produce 2,000,000 tons of clean coal per year from the Kentucky Nos. 11 and 12 seams. Featured at this modern operation on the Green River in western Kentucky is flexibility that permits independent operation of mine, preparation plant or barge-loading facilities.

• Trends in municipal, state and federal legislation show that an all-out attack on smog is in the offing. The lead article (p 54) explains how coal can gain added public relations and sales benefits from anticipating this attack. The discussion includes suggestions on what individual companies can do to step up and expand the industry's existing air clean-up programs.

In the works . . .

• A report on coal in captive Europe. What are coal-production targets in the satellite countries? Are they being hit or missed? Watch for the factual report in an early issue.

• Also coming . . . slope driving using a rock loader and an extensible belt . . . stripping scattered tracts with nimble machines . . . hauling culm-bank material to a heavy-media reclamation on a long belt conveyor.

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Down where it's damp and dusty...

Multifak gives bearings extra protection

BEARINGS in underground mining equipment have two persistent enemies—abrasive dust and rust. But you can beat them by using *Texaco Multifak* because this finer lubricant assures longer bearing life and lower maintenance costs.

Lubrication is easier, too. *Texaco Multifak* can be used in all grease-lubricated bearings of motors, locomotives, cutters, loaders—equipment of any kind. This one fine grease does many jobs. You have less lubricant inventory, less chance of making a lubrication mistake.

Check the features that make *Texaco Multifak* your best buy: 1) Pumps easily, even at low temperatures; 2) Stoutly resists oxidation; 3) Says "no" to dust and wear, water and rust; 4) Stands up in tough service.

To lubricate wire rope and open gears, use *Texaco Crater*. Some operators prefer *Texaco Crater X Fluid* which *goes* on as a liquid, *stays* on just like the regular *Crater*. Either way you'll keep your rope strong longer, get smoother operation and longer life from your gears.

Let a Texaco Lubrication Engineer help you. He can suggest many ways of cutting costs through effective lubrication. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N.Y.

LUBRICANTS for the Coal Mining Industry

LOOK TO THE ALLIS-CHALMERS LINE . . . TO

Match the needs of your tractor

If you're looking for big capacity, mobility and wide-range versatility — at low cost — the tractor shovel you need is in the Allis-Chalmers line.

First — advanced-design features make Allis-Chalmers tractor shovels the most productive and widely accepted in earth-moving and material handling fields. Second — each unit offers a shovel that's a built-in part of the tractor — not just an attachment. Third — you have a choice of four sizes to match the needs of your jobs most efficiently.

You can increase Allis-Chalmers tractor shovel usefulness even more by replacing the standard bucket with a variety of quick-change attachments, such as a light materials bucket, rock bucket or rock fork . . . or by adding a rear-mounted ripper.

On every job, your Allis-Chalmers tractor shovel provides all these important advantages for you and your operator:

- Superior balance and low center of gravity
- Sure-footed stability with extra long track
- Greater strength with heavy, welded-steel shovel, side frames and low stabilizer
- Bucket design that makes loading and dumping fast, clean and easy
- Simplified hydraulics with 3-way, full-flow filtering
- Powerful, long-life Allis-Chalmers diesel engine
- All-steel main frame and one-piece final drive and steering clutch housing
- Timesaving service simplicity
- Heavy-duty roller bearing truck wheels
- 1,000-hour lube intervals on truck wheels, idlers and support rollers
- Better visibility, comfortable seats, and easy operating, accessible controls

4 YD

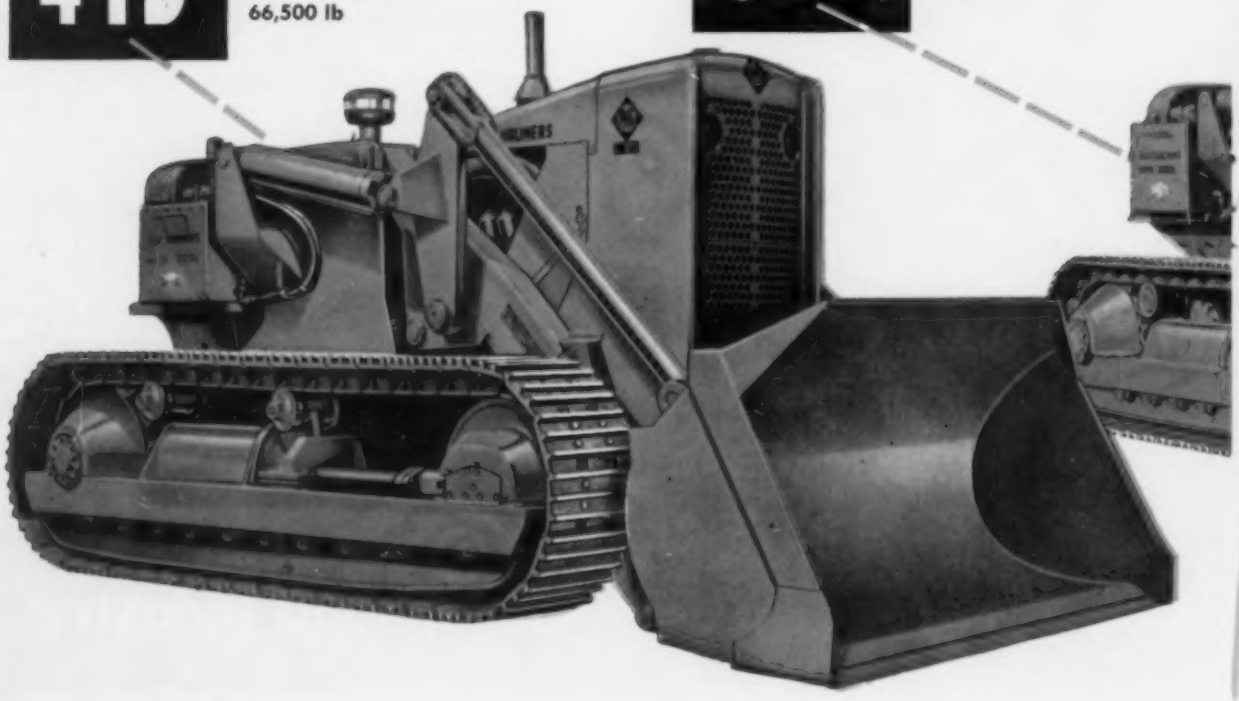
HD-21G

torque converter drive
13-ft, 4-in. dump height
204 net engine hp
66,500 lb

3 YD

HD-16G

torque converter drive
12-ft, 3-in. dump height
150 net engine hp
47,800 lb



shovel jobs

1½YD

HD-6G

10-ft dump height
7′ net engine hp
19,600 lb

2¼YD

HD-11G

11-ft, 7-in. dump height
110 net engine hp
32,000 lb

Ask your Allis-Chalmers Construction Machinery dealer for the complete story and for a look at one of these great tractor shovels at work. And remember, your dealer is headquarters for factory-trained servicemen, factory-approved facilities and complete stocks of True Original Parts.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

Just how good is a NEOPRENE belt?

IF you took a new neoprene belt and a new conventional belt and ran them side by side under identical operating conditions, here's what you'd find:

You'd notice little or no difference in operating characteristics. Neoprene belts give you no less friction on the drive pulley . . . require no more drive power and no greater belt tension. They trough well and remain flexible in cold weather.

You'd find that the neoprene belt gave somewhat longer service. Both belts resist abrasion, cutting and wear and tear equally well. Both protect the fabric from mold and acid water. But neoprene resists aging and *retains* its original properties longer. In addition, neoprene resists softening from oil and can withstand sunlight and weather without cracking. As the years of service roll up, neoprene's resistance to *all* sources of deterioration becomes important.

Neoprene offers one advantage of particular importance in underground mining: flame resistance. It is self-extinguishing and will not spread fire. That's an important factor in mining safety.

WHAT IS NEOPRENE? It's a synthetic rubber made by Du Pont and it's been on the market since 1932. Du Pont makes no finished products of neoprene —that's done by the rubber companies. These firms know the requirements of industry and make a wide variety of neoprene products to meet them.

WHO MAKES NEOPRENE BELTS?

The same rubber companies that have been making your conventional underground belting have also been making neoprene belts for many years. They make them on the same equipment and in the same constructions as ordinary mine belts. They ply up and vulcanize the belts the same way. These companies are prepared to give you neoprene belts of *top quality*, approved for flame resistance by The United States Bureau of Mines.

HOW CAN YOU CHECK NEOPRENE'S PERFORMANCE?

Right in your own mine. Neoprene covers are used on your trailing cable and on most of the hydraulic hose on your mining machines. If your processing plant carries oiled coal, the conveyor belt used is almost certainly neoprene.

We'll be glad to tell you more about neoprene's properties. Just write: E. I. du Pont de Nemours & Co. (Inc.), Elastomers Division CO-10, Wilmington 98, Delaware.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

DU PONT

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21565

Patented & Patents Pending

RUGGED . . . POWERFUL . . .

yet so easily maneuvered
the GOODMAN CONTINUOUS BORER

This rugged machine has all the capacity, power and maneuverability needed for any phase of development or full production work.

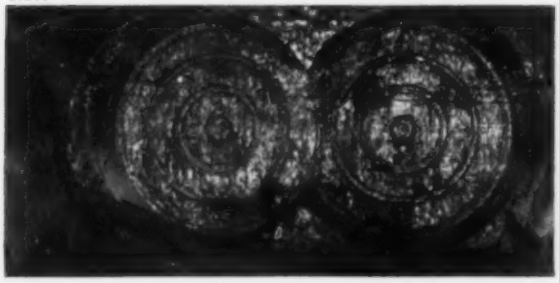
For example, at one mine in room and pillar work the Goodman averaged 740.46 tons per shift for 27 shifts in one month. Average per man per shift for an 8 man crew, including roof bolters, mechanic and foreman, totaled 92.55 tons. For a six month period the same machine averaged 724.97 tons per shift with a tons-per-man average of 90.62. Mining height was 7 feet, width of path cut exceeded 13 feet. Two shuttle cars took the coal from the Continuous Borer to mine cars.

There were other important benefits, too. With the Goodman Continuous Borer, fewer working faces were needed to produce high tonnages, supervision of the work was closer, hazards associated with drilling and blasting were eliminated, an arched path with narrow span of flat roof offered natural support. The short overall length of the machine made short radius turns possible, and retraction of the cutting elements left safe tramming clearances at top, bottom and sides.

If high production and low costs are your responsibility you'll want the full story on Goodman Continuous Borers. Our sales engineers will be glad to help you.

Goodman Borer cuts coal with bits contacting only small area of face. Percentage of lump is high.

21244



GOODMAN

MANUFACTURING COMPANY

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CUTTING MACHINES • CONVEYORS • LOADERS
SHUTTLE CARS • LOCOMOTIVES • CONTINUOUS MINERS

Use Genuine Goodman Replacement Parts

Here's Protection Against Severe Roof Falls

A severe roof fall can mean trouble in more ways than one. It may result in injuries to workmen. It also means loss of production.

But damage from severe roof falls is far less likely when you carry out a modern roof-bolting program, using either the Bethlehem ¾-in., ⅝-in. or ⅞-in. square-head roof bolt and expansion shell. This method of roof support makes the mine a safer place in which to work because it effectively anchors the rock.

Other Advantages In addition to promoting safety, roof bolting also offers the advantages of increased production through operating mechanical equipment close to the face; improved ventilation; faster transport; less damage to equipment; better housekeeping; no fire hazard.

How Bolt is Used A leaf-type malleable iron shell is attached to the Bethlehem square-head bolt before it is placed in the hole. When the bolt is tightened, the leaves of the shell expand to firmly grip the sides of the hole. Additional support is provided by a square roof plate. A hardened washer is used between the bolt head and roof plate to minimize friction.

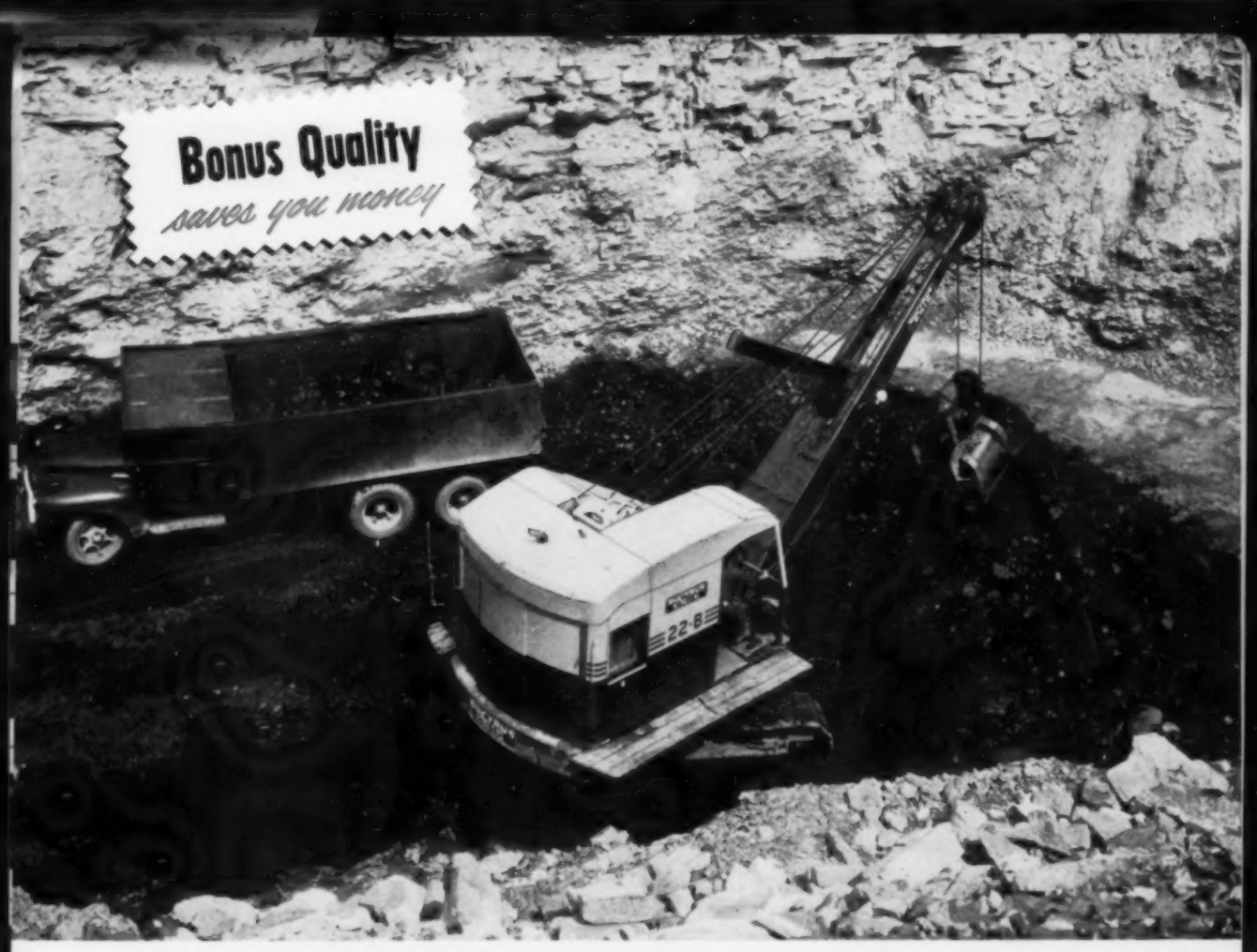
You'll want to look into the possibilities of a roof-bolting program, using the Bethlehem square-head bolt. Or perhaps you would prefer Bethlehem's slotted wedge-type bolt, also designed for roof support. Either way, you'll find the nearest Bethlehem sales office ready to answer your questions. Why not call them right now?

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM MINE ROOF BOLTS

BETHLEHEM STEEL



This ¾-yd. Bucyrus-Erie 22-B shovel is loading out coal in an open-pit mine near Clarion, Pa.

Here's a long term investment in cost-saving mechanization

An important added advantage of mechanizing with Bucyrus-Erie shovels is the extra years of efficient service they perform. Here are just a few reasons why:

Bucyrus-Erie controls the quality of every component. Each lot of steel undergoes standard metallurgical tests to ascertain if our rigid specifications have been met and where conditions warrant it photomicrographs are made to permit a study of the grain structure. Bucyrus-Erie is one of the few companies that pours its own castings, in foundry facilities unsurpassed in the industry.

And just as important — each model is engineered completely new from the ground up. Existing machines are not "modified" simply to create a "new" model.

This attention to quality in design and manufacture results in machines requiring minimum upkeep and adds years of service life. Your Bucyrus-Erie distributor has complete details on machines from ⅜- to 4-cu. yd. For information on larger capacity loading and stripping shovels, write direct.

244E56C

Bonus Quality Bucyrus-Erie leaves nothing to chance. This sample furnace charge, like all others, will be thoroughly tested to insure that its properties meet the highest specifications. It's just added insurance to guarantee top excavator performance.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

This Heavy Duty Coal Belt Cuts Cost in Tough Hauls!

Ray-Man Conveyor Belt is engineered to stand up where ordinary belts tear, puncture, or experience fastener pull out. Elastic cushioned strength member plies made from strong, natural and synthetic fabric give this belt resilience to the impact of shock loading flexibility to trough easily and train naturally. Compensated, balanced construction relieves outer ply stress, prolongs belt life. Ray-Man requires no breaker strip and offers exceptional fastener holding ability under extreme conditions of use. Ray-Man Conveyor Belt cuts handling costs because it does a better job . . . and *it lasts longer.*

Like all Manhattan heavy duty conveyor belts, Ray-Man is mildew-proof and moisture resistant. R/M's exclusive "XDC" Cover protects the belt against wear, tear, cuts and abrasion to a degree never before attained.

For unusually abusive shock loading, R/M's extra-cushioned Homocord Conveyor Belt may be better suited for your job. An R/M representative will help you compare the advantages of all R/M Conveyor Belts to determine the one that will cut your handling costs most . . . give you "More Use per Dollar" in your operations. Contact him today . . . or write for Bulletin 6906 and 6915.

RM 601C

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls

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Convenient locations of plants and magazines mean prompt, efficient service to AMERICAN'S customers.

Call on your AMERICAN representative for assistance on any unusual blasting problems.

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Blasting Powder
Blasting Caps
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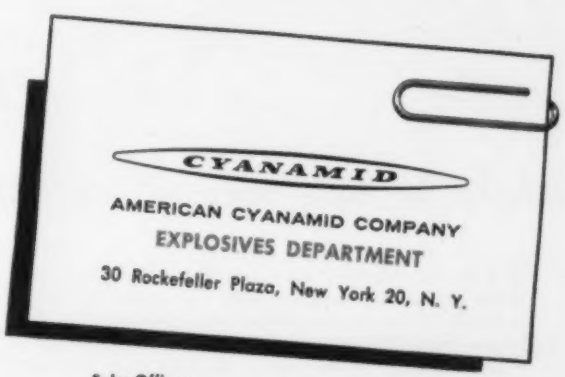
Regular Delay
Split-second Delay
Blasting Accessories



Sales Offices:
New York City, Latrobe, Pa., Pottsville, Pa.
Scranton, Pa., St. Louis, Mo., Bluefield, W. Va.

...If it's* AMERICAN, *it's dependable!

Dump in *one second* with Dumptor®

On the above operation, Koehring Dumptor drives up to the hopper, body forward. Operator trips the body-release lever, and *gravity* tilts the 6-yard body 70 degrees. One second later the load is out, and Dumptor is on its way back for the next load. Because there is no waiting for slow-acting body hoists, *gravity-dumping* saves 15 to 25 seconds on every round trip. This adds up to a substantial increase in extra yards per hour. For instance — take a typical 1,000-foot haul, where you normally would make 16 trips an hour. By saving an average of 20 seconds dump-time on each trip, Dumptor gains 320 seconds, or 5.3 minutes more productive haul-time an hour. You get 17½ trips, instead of 16. This, alone, adds 9% to hourly production. What's more, there are no expensive hoist-replacement parts, or hoist maintenance time. *Gravity-dump* never wears out, never balks. You get the same one-second dumping *every time,* under heaviest loads, in all temperature extremes. Better check what this can mean in lower costs, and increased production on your hauling operations. Get the complete Dumptor story from your local Koehring distributor. *Call him today.*

Plenty of power on the haul – You get better than 6 h.p. for every ton of loaded weight when you haul with heavy-duty Dumptor. That's why it accelerates fast, pulls through soft ground, up ramps and grades with less shifting — climbs 24% grades fully loaded. When hauling heavy materials, extra horsepower means extra load-carrying capacity.

No-turn shuttle hauling – Dumptor solves problems of operating in tunnels, along overhead trestles, or narrow haul roads. There is no need to turn, because it travels with equal ease, power and speed in either direction. No-turn hauling offers a big production advantage, too. Every turn saved cuts 15 seconds off cycle time, increases output.

Easy-loading target – Big, 64 square-foot body opening permits loading Dumptor over the side or either end. This saves spotting time, reduces spillage. Heavy duty body is built for rock. Top edge and bottom are box-beam constructed. Sides and ends are rib-reinforced. In fact, Dumptor has a ton of strength for every ton of payload capacity.

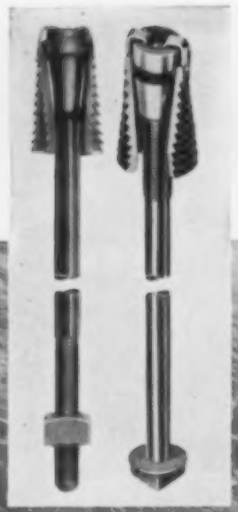
Time-saver on stockpiling – Dumptor puts stockpiling on a fast shuttle-haul basis — eliminates turning on top of pile. Notice how instant dumping action kicks the load out over edge of pile — saves a lot of dozer clean-up. Free-swinging kick-out pan breaks load suction in wet, sticky materials, bolts down to floor when handling rock.

KOEHRING COMPANY, Milwaukee 16, Wis.

Subsidiaries: PARSONS · KWIK-MIX · JOHNSON · KOEHRING-WATEROUS LTD.

KOEHRING HEAVY DUTY

REPUBLIC HELPS YOU 2 WAYS



ACTUAL EXPERIENCE WITH ROOF BOLTING is the foundation for design of Republic's full line of Mine Roof Bolts. Most versatile types are the exclusive forged wedge head bolt and the square head bolt with wedge nut and forged rigid expansion shell shown in inset above. All types are backed by a century of fastener manufacturing know-how, plus a strict quality-control program extending from raw ore to finished product.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

IN SOLVING ROOF BOLTING PROBLEMS

Maximum security of your bolted mine roof depends on two main factors:

1. Selection of the proper roof bolt
2. Proper location and placement of bolts

Republic is the only Mine Roof Bolt supplier in a position to help you determine the best answer to both parts of this problem.

In the first place, Republic alone manufactures all four major types of mine roof bolt assemblies. These include the *slotted mine roof bolt;* the *conventional bolt and expansion sleeve shell;* the *square head bolt with wedge nut and rigid expansion shell;* and the *forged wedge head bolt with rigid expansion shell.* Investigation of overhead strata, headroom and method of placement are necessary to select the most suitable type or types for a given mine. Here, again, Republic can give you valuable assistance.

Based on extensive operating experience gained in its own and other coal and ore mines throughout the United States, Republic has amassed a wealth of data on successful mine roof bolt application. As a result, our Bolt and Chain Division can, on request, send a specialist to your mine to conduct thorough tests and impartially recommend the proper type of bolt and installation procedure.

It will pay you to make Republic a part of your team in promoting safer and more efficient roof bolting throughout your mine. Simply contact your local Republic Office or mail the coupon today.

PROTECTION AGAINST SEVERE CORROSION PROBLEMS of electrical conduits is provided by Republic Dekoron®-Coated ELECTRUNITE® E.M.T. This versatile electrical raceway gives your circuits the dual protection of its extruded polyethylene plastic armor against fumes, gases and vapors plus the mechanical strength of steel. When properly installed, long-lasting protection is assured from outlet to outlet. Send coupon for details.

WATER-HANDLING PROBLEMS in this mine were solved by installation of Republic's four-inch flexible plastic pipe. Prior to this installation, original piping was destroyed within six weeks by an acid water condition. The plastic pipe shown has been in service 18 months and is still in excellent condition. For complete information, mail coupon.

CLEANING PLANT CLASSIFIER PROBLEM was solved by installing a solid ENDURO® Stainless Steel bottom. In operation, the unit is subjected to extreme abrasion and scouring by the slurry mixture of coal, waste and water pumped from the revolving arms. Because it resists abrasion and pitting, ENDURO has proved best for long-term economy.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
Dept. C-1700
3124 East 45th Street, Cleveland 27, Ohio

Please send me complete information on:

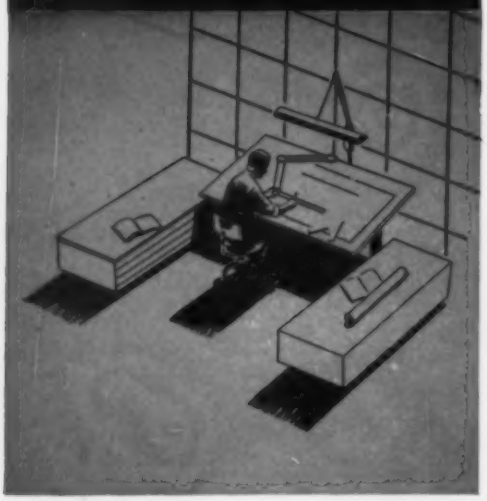
☐ Mine Roof Bolts ☐ Stainless Steel
☐ Plastic Pipe ☐ Dekoron-Coated E.M.T.

Name_____

Company_____

Address_____

City_____ Zone____ State_____



Modernizing old or building new be sure its Better-Built by having it FAIRMONT -Built. Call your Fairmont engineer NOW!

FAIRMONT -built means a Better-Built PREPARATION PLANT

FAIRMONT–built stands for superior planning, tested design, skilled engineering, fabricating and erecting by an organization of specialists backed by more than 60 years experience.

FAIRMONT–built provides independent selection of top-flight equipment best suited for the particular installation and the results expected.

FAIRMONT–built assures uniformity of product plus better than 99% separating efficiency.

FAIRMONT–built means that here is a cleaning plant correctly engineered and properly equipped to meet tomorrow's needs as well as today's.

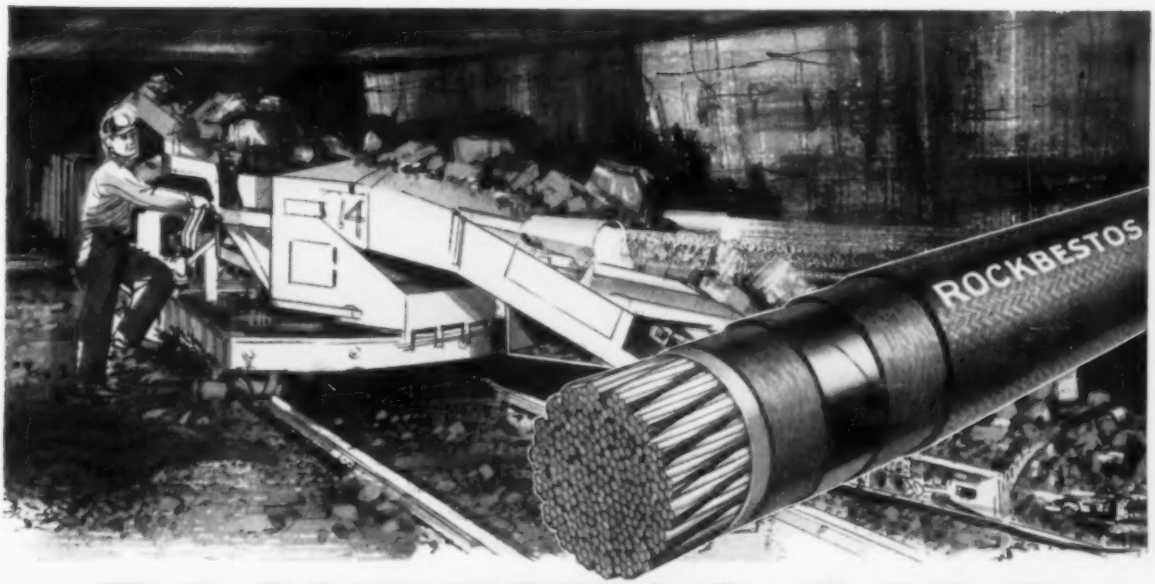
FAIRMONT–built brings a trained pilot crew to operate the new plant and train permanent operating personnel.

FAIRMONT
MACHINERY COMPANY
FAIRMONT, WEST VIRGINIA

DESIGNERS AND CONSTRUCTORS OF COMPLETE COAL PREPARATION PLANTS USING BOTH WET AND DRY CLEANING, CENTRIFUGAL AND THERMAL DRYING.

MECHANIZATION

KEEPS PRODUCTION COSTS DOWN



ROCKBESTOS A.V.C.

MINING CABLE

KEEPS EQUIPMENT "ON THE GO"

Leading mine machinery manufacturers have for years wired their equipment such as continuous miners, loaders, cutters, shuttle cars, locomotives with Rockbestos A.V.C. as standard equipment.

Built to stand up and give the kind of trouble-free performance you need, Rockbestos A.V.C. . . . the felted asbestos wall construction . . . means less equipment down time and lower wire maintenance costs.

Rockbestos A.V.C. won't ignite or carry flame. It remains flexible and won't dry out or crack . . . safely takes conductor heating overloads. It won't bloom or rot when exposed to grease and oil. And it fits bushings right.

When buying new equipment or servicing old . . . be sure . . . specify Rockbestos A.V.C. Mining Cable.

ORDER FROM THESE JOBBERS — SPECIFY "ROCKBESTOS A.V.C."

BECKLEY, W. VA.	INDIANA, PA.
National Mine Service Co.	National Mine Service Co.
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ROCKBESTOS PRODUCTS CORPORATION

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NEW YORK • CLEVELAND • DETROIT • CHICAGO • PITTSBURGH • ST. LOUIS
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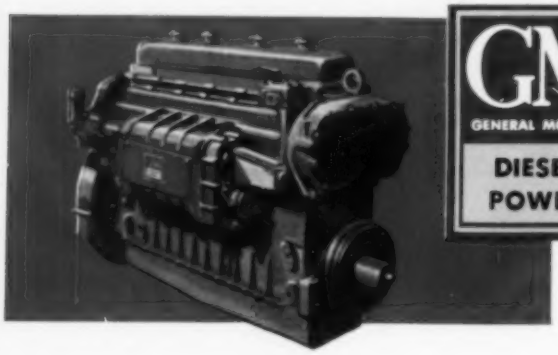
Diesel for Mining?

Equipment shown above includes: Eimco tractor-loader; LeTourneau-Westinghouse Tournatractor and Rear Dump; Lima Paymaster shovel; Gardner-Denver air compressors. Write for list of over 1000 GM Detroit Diesel power applications.



GM
GENERAL MOTORS
DIESEL
POWER

DETROIT DIESEL

Engine Division of General Motors

Detroit 28, Michigan
In Canada: General Motors Diesel Limited, London, Ontario

Single Engines... 30 to 300 H.P. *Multiple Units... Up to 893 H.P.*

America's Largest Builder of Diesel Engines

What is the best

It's GM . . . America's First Choice Diesel . . . and here's why:

Best Diesel for mining—or any other job, for that matter—is the one that does the most work at the lowest cost, above or below ground.

That's why General Motors Detroit Diesel engines today handle more different mining jobs than any other Diesel.

These compact, clean-running 2-cycle engines drive loaders, air compressors, draglines, locomotives, pumps, shovels and the most powerful trucks and tractors. GM Diesels are available in more than 1000 different applications of power machinery for every job from 30 H.P. up.

And with the recent addition of Turbopower engines to the line, increased horsepower with greater efficiency is now available in the same size engine. These new Turbopower Diesels develop up to 17% more power on no more fuel —or the same power with a 15% saving in fuel.

Next time you order new equipment—or repower old—be sure to specify GM Diesel. It's America's FIRST CHOICE Diesel *because it does more work at less cost!*

EXIDE-IRONCLAD BATTERIES

For all mining applications

Deliver the power over a wide range of temperatures

BATTERY FOR MINE LOCOMOTIVE. Exide-Ironclad Model MVM. Write for copy of Bulletin No. 5161.

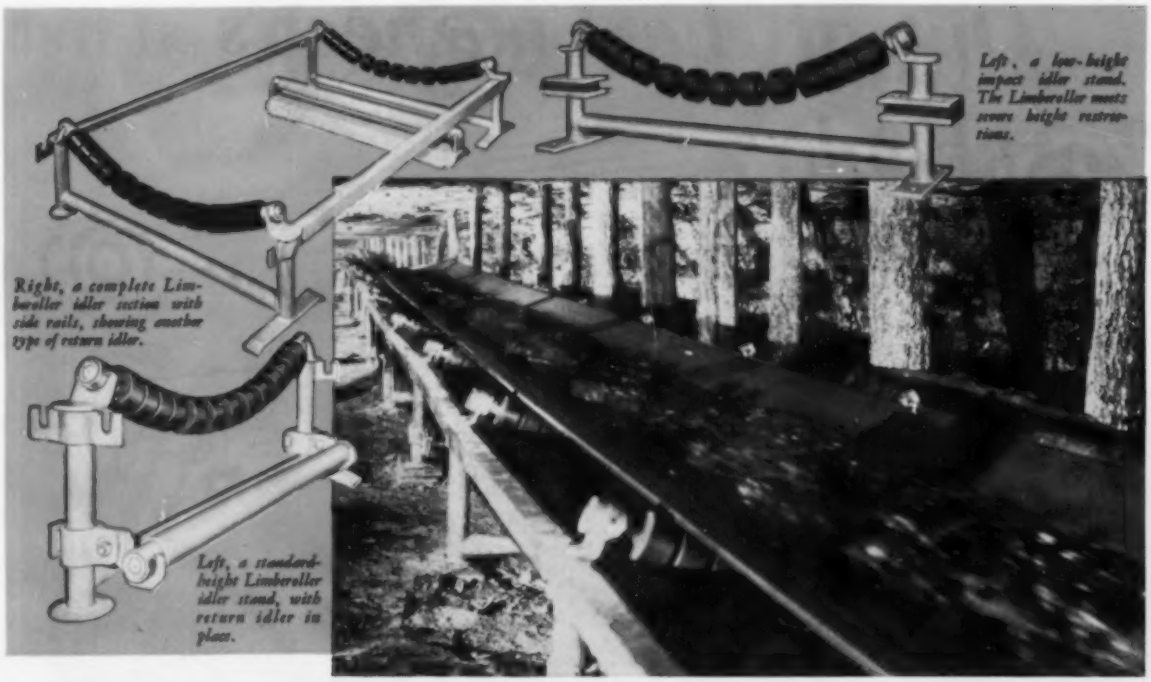
At few places on earth do storage batteries ever encounter such extremes of cold and heat as are used to test Exide-Ironclad Batteries in the laboratory.

These tests prove that Exide-Ironclad Batteries can be depended upon over a wider range of temperatures than they are ever likely to be asked to endure. And they provide tangible extra assurance of dependability at all the more normal operating temperatures.

Extreme temperature performance is especially important when a battery must have continuous dependability. It is often at these extremes that a battery is most needed. And a battery cannot be called dependable unless it can be counted on every day—all of the time.

The high and low temperature performance of Exide-Ironclad Batteries is a direct result of their unique construction features and special engineering. In countless applications, these batteries have earned an unmatched reputation for long life and high capacity. When you need batteries for heavy duty uses, be sure to specify Exide-Ironclad. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

Exide®



Left, a low-height impact idler stand. The Limberoller meets severe height restrictions.

Right, a complete Limberoller idler section with side rails, showing another type of return idler.

Left, a standard-height Limberoller idler stand, with return idler in place.

JOY LIMBEROLLER CONVEYOR IDLERS SAVE BELTING • ELIMINATE SPILLAGE • REDUCE CLEAN UP TIME

Because they install up to eight times faster than solid metal idlers, Joy Limberollers save you money before they carry even a pound of payload. The 36″ wide, 3600 ft. long Joy belt conveyor pictured above is installed in a Virginia mine operating in the Norton seam.

The new 36″ belt, completely equipped with Limberoller idlers, takes the discharge from *three* 26″ belts. It handles the coal to the discharge end without spillage, freeing clean-up men for other duties.

Limberoller idlers are an exclusive Joy development designed for hard, dirty, continuous underground service. Each idler is a single roller consisting of a series of neoprene discs molded in one piece on a core of flexible steel cable. There are only two self-lubricated bearings per idler—*one at each end, up out of the dirt.*

Thousands of Limberollers are in highly successful use today. At this mine, officials say they're well pleased, both with no spillage and with the open construction of section frames that permits easy inspection. Since starting up the belt in early Autumn, 1955, they've had no trouble, no failures, no maintenance. Production rates are improved, and belt life is increased more than 20% due to better troughing and reduced shock on the belt by the Limberollers.

There's just one best answer to belt conveyor problems—and that's the Joy Limberoller idler. Let us work with *you.* **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

- Follows mine bottom, withstands greater misalignment.
- No spillage, centers the load and shapes to it.
- Easy to extend or retract—to handle, store and haul.
- Less time and easier to set up, knock down and move.
- No lubrication needed, no bolts or cover sheets required.
- Fewer idlers required: spaced at least 50% further apart.
- All components can be transported on the belt.
- No worry over which end of conveyor sections goes in first.
- Less friction to start up, only 1/3 as many bearings.
- Only 1/3 as heavy as steel idlers, easy to change.
- Ideal for hard-to-get-at locations—put it in and forget it.
- Less belt wear, longer life.

Write for FREE Bulletin 125-1

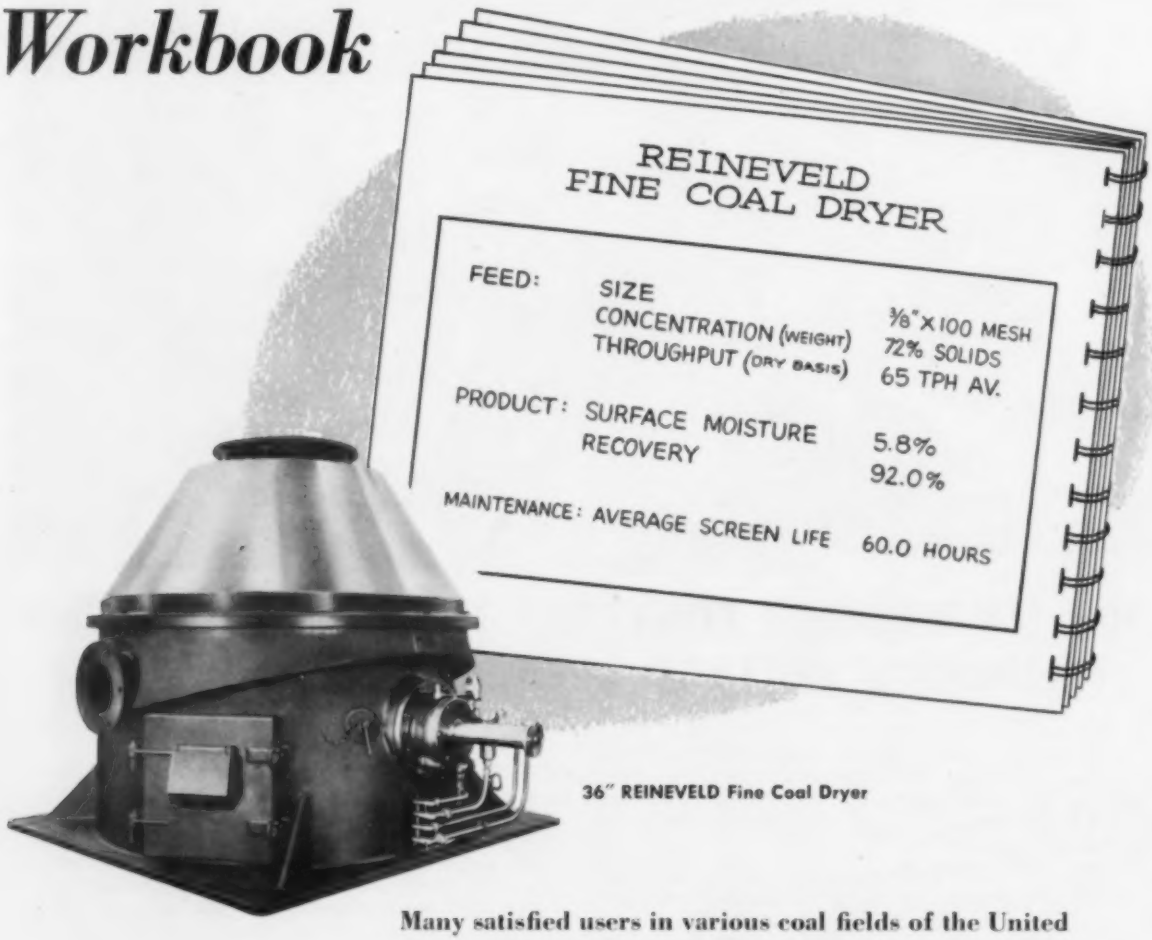
Consult a Joy Engineer

JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

WSW-CL-6250-128

Out of the Engineer's Workbook

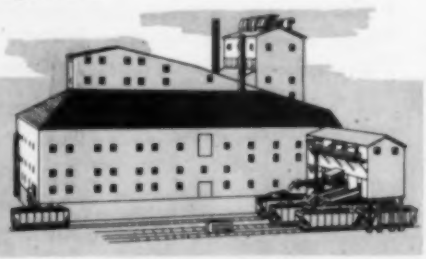


36" REINEVELD Fine Coal Dryer

Many satisfied users in various coal fields of the United States testify to the excellence of this centrifugal fine coal dryer. Drying is accomplished swiftly and continuously by high gravity forces imposed on the feed particles by the high-speed spinning motion of the drying elements.

Delivery can be made promptly from the complete line of Reineveld Coal Dryers and parts carried in our Pittsburgh stock.

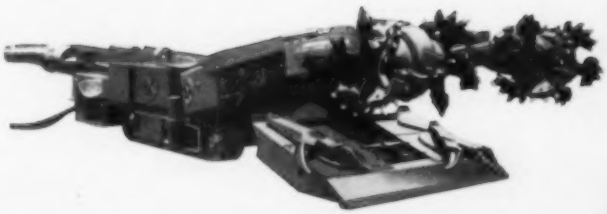
For an economical and efficient solution of your fine coal dewatering problems, contact your H & P Sales Engineer.



Heyl & Patterson INC.

'55 FORT PITT BLVD. PITTSBURGH 22, PA. PHONE COurt 1-0750

ONLY THE Lee-Norse MINER gives you



"PATTERN CUTTING"

The Lee-Norse Miner cuts a "DIAMOND PATTERN" in the face of the coal by simply revolving and oscillating the cutters at the same time. This is sometimes called "milling the coal off the face."

Every single Cutter Bit follows a right and a left spiral thread which produces the multiple criss-cross kerfs in the face of the coal. The diamond pattern is unique and very *important* because:

1. It cuts more coal with less power.
2. It produces coarse cuttings and less fines.
3. It is a simple and rugged mechanical device.
4. It instantly follows any variation in the thickness of the coal seam.
5. It is the ONLY REALLY NEW cutting tool introduced in recent years.

The Lee-Norse Miner is essentially a modern loading machine plus the most practical device for cutting coal. The Lee-Norse Miner loads all the coal from the floor with improved "dual" gathering arms and a flexible rear conveyor. Excellent clean-up . . . fast tramming.

Lee-Norse Company

CHARLEROI, PA.

DESIGNERS AND BUILDERS OF THE MINE PORTAL BUS

BUILT FOR ROCK-HARD ROAD WORK

The Allis-Chalmers HD-21 is a Real Miner's Tractor

Chiseling an access road through rock demands "something extra" in crawler tractor performance and durability, yet it's the kind of job any miner's tractor may be required to do.

Conditions like this call for an Allis-Chalmers HD-21. Its 204-hp Allis-Chalmers engine is noted for its ability to perform with a minimum loss of efficiency even after thousands of hours of operation. Torque converter drive multiplies torque up to 4½ times . . . develops 41,500 lb drawbar pull at low speeds . . . cushions the entire power train against load shocks.

New Tru-Dimension tracks bring a new high in track durability. Thousand-hour lubrication intervals save maintenance time. Positive seals protect idler, support roller and truck wheel bearings from abrasive wear as no other seals can.

Ask your Allis-Chalmers dealer to show you the many other features that make the HD-21 a natural for rock-hard assignments.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

"Sunday-Punch"

The pin-point blasting that rips away the side of a hill for strip mining is just one of the many mining operations in which Simplex products play an important part. Simplex-TIREX trailing cords and cables, engineered especially for mining work, are on the job in and around mines everywhere. TIREX cables are newly improved for greater flexibility. Their cured-in-lead Neoprene Armor resists abrasion, oil, heat and water, and gives longest life.

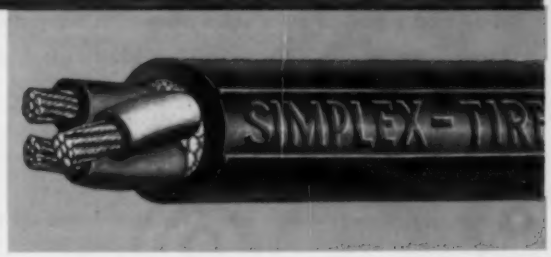
SIMPLEX WIRE & CABLE CO.,
79 Sidney Street, Cambridge 39, Massachusetts.

Wire Sculpture by Harry Stanley

LIVE BETTER ELECTRICALLY

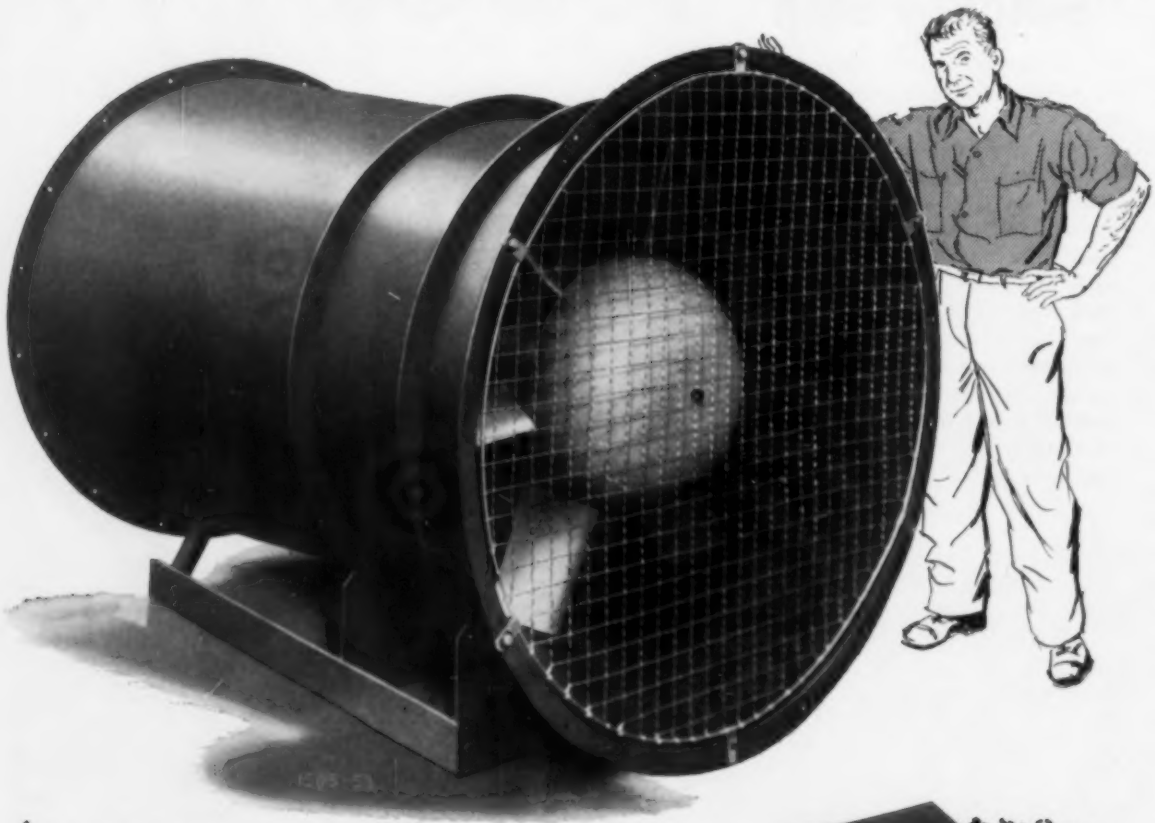
Simplex

TIREX



Consider the JEFFREY 6-F FAN

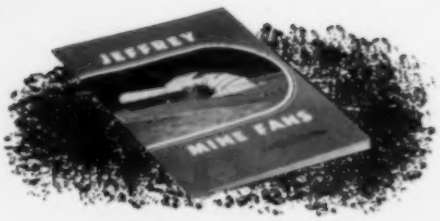
FOR YOUR LOW AND MEDIUM VOLUME-PRESSURE NEEDS



A smaller fan, run at higher speed, often moves air through a mine more efficiently than a larger fan. It's a question of proper engineering and installation. As a result, you get better ventilation with a lower investment and operating cost.

Jeffrey maintains a capable engineering staff for solving mine ventilation problems. Their recommendations may call for the smaller Type 6-F AERODYNE® fan, offering these features:

- **Universally adjustable blades made of cast aluminum alloy and mounted on a solid aluminum alloy hub**
- **Air reversal possible by reversing blade pitch or direction of rotation**
- **Flange-mounted anti-friction bearings**
- **Various lengths of expansion discharge for different duties**
- **Overhung drive and fan wheel for belt drives up to 125 HP and built-in motor where size permits**



Send for Catalog 901

It illustrates and describes the complete line of Jeffrey ventilating equipment—fans and blowers to meet every mining condition. For a copy, write to The Jeffrey Manufacturing Company, Columbus 16, Ohio.

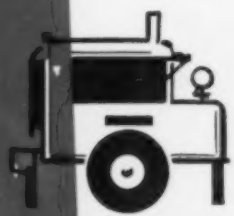
JEFFREY

MINING • CONVEYING • PROCESSING EQUIPMENT
TRANSMISSION MACHINERY • CONTRACT MANUFACTURING

Got a tough job?

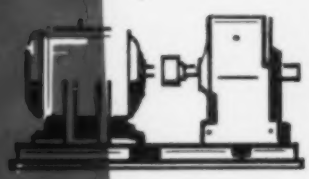
Give it to STANOIL Industrial Oil

This oil gives superior lubrication to a long list of mine equipment—here are three big jobs it can do—



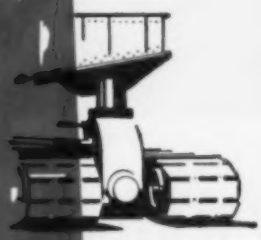
COMPRESSOR

High oxidation stability and low carbon-forming characteristics of STANOIL virtually eliminate the danger of carbon deposits on valves. STANOIL separates readily from water. There is no problem of emulsion in compressor crankcase.



SPEED REDUCER

There are many years between maintenance jobs on speed reducers when STANOIL is the lubricant. Herringbone gears remain clean and free of wear. Low pour point of STANOIL gives oil ability to flow freely from a cold start. No trouble either in prolonged, high temperature operation.



HYDRAULIC JACKS

Tough mine hydraulic service is the ideal place for STANOIL. High viscosity index and low pour point of STANOIL assure smooth operation no matter what the temperature. STANOIL resists contamination, will not emulsify.

Pick your tough lubrication jobs, give them to STANOIL Industrial Oil and get the results you have wanted. Find out more. Call your Standard Oil industrial lubrication specialist. There is one near you in any of the 15 Midwest and Rocky Mountain states. He is experienced in mine lubrication. Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Illinois.

Quick Facts About

STANOIL Industrial Oil

- **Stability**—STANOIL's antioxidant gives oil resistance to chemical change, minimizes deposits.
- **Rust Prevention**—Inhibitor in STANOIL "plates out" on metal surfaces, prevents corrosion.
- **Cold Starts**—STANOIL has low pour point. Flows freely from cold start. No need for costly warm-ups.
- **Resists Effects of Temperature Change**—STANOIL has high viscosity index, is resistant to temperature change.
- **Has Excellent Demulsibility**—STANOIL is refined to eliminate emulsion problems, contains additive to minimize foaming.

STANDARD OIL COMPANY
(Indiana)

STANDARD

ENGINEERING REPORTS:

HIGHLY MECHANIZED preparation plant helps Compass Coal meet customer demand for top-quality products at low cost.

Compass Coal Achieves Top-quality, Low-cost

CLOSE CO-OPERATION between G-E application engineers and J. S. Mathews, Compass Coal Division Superintendent, (right) assured smooth plant start-up.

General Electric system-engineered equipment plays key role as Compass plant expands to meet growing demand for coal

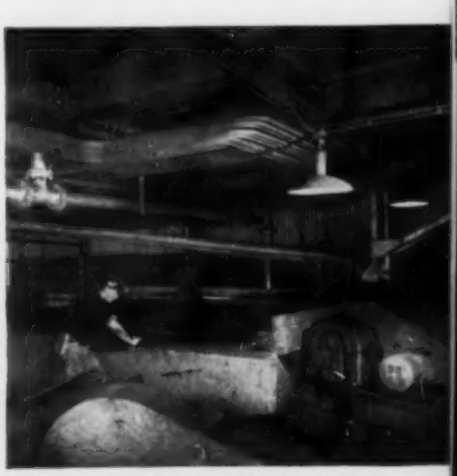
Compass Coal Company recently took another stride in the coal industry's intensified program of expansion and mechanization with the start-up of its new preparation plant at Dola, West Virginia. Designed for cleaning top-quality coal at a rate of 450 tons per hour at the company's Compass No. 2 mine, the modern Compass plant is an excellent example of an industry-wide move to reduce production costs through increased operating efficiency and electrification.

Working closely with Fairmount Machinery Company, the electrical contractor, General Electric engineers planned and designed an entire electrical system for the up-to-date Compass plant. Because of the closely co-ordinated sequencing necessary in preparation plants, each item of General Electric power distribution, control, and utilization equipment was system-engineered for maximum efficiency. This smooth-functioning system has assured Compass Coal Company of continuous, properly sequenced operation with more tons of coal processed per man-hour of labor and per kilowatt of power.

COMPACT CABINETROL* panel provides centralized motor control. Custom-engineered, they are easy to expand by adding new sections to existing panels.

TOTALLY-ENCLOSED G-E Tri-Clad* motors driving vacuum pump are protected against dust, dirt, and abrasives. Motors are built for this severe duty.

MINIMUM MAINTENANCE is necessary with sturdy, long-life Tri-Clad* motors providing reliable power for run-of-mine conveyor at initial cleaning stage.



RUGGED TRI-CLAD '55' MOTOR drives Deister concentrating table at the fine-coal cleaning stage of the preparation process where compactness is a must.

Production with New Preparation Plant

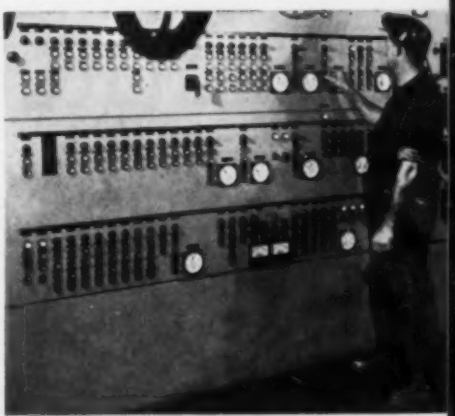
When increased energy demands from industry and utilities cause you to plan an expansion or modernization of your preparation facilities, call in General Electric early in the planning stages. Long experience in the electrification of many coal cleaning plants—large and small, wet and dry—has made G-E engineers thoroughly familiar with the methods and problems of coal preparation. This experience, coupled with the broad range of products manufactured, makes General Electric particularly well prepared to design and furnish the co-ordinated electrical equipment for your coal preparation plant.

To learn more about General Electric's modern electrical systems for coal preparation plants, contact your nearest G-E Apparatus Sales Office or write to General Electric Co., Sect. 663-45, Schenectady 5, N.Y.

*Reg. Trade-mark of General Electric Co.

Engineered Electrical Systems for the Coal Industry

GENERAL ELECTRIC



NERVE CENTER of preparation plant operation is G-E master control panel. Starter buttons are arranged in proper sequence to control cleaning operations.

IMPOSSIBLE WITHOUT EXPLOSIVES

On a mountainside in West Virginia, overburden up to 80 feet in height—sandstone, shale, and slate—is blasted with the correct type of Hercules® dynamite to uncover seams of coal 7 ft. thick. Speedy, economical shovel-loading operations are maintained by loosening the coal with small charges of explosives.

Hercules has long pioneered in developing explosives for every type of project. Our experience and service facilities can help you solve blasting problems in mining, quarrying, construction, seismic explorations—wherever explosives are needed to get a job done.

HERCULES POWDER COMPANY
INCORPORATED
Explosives Department, 936 King Street, Wilmington 99, Delaware
Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Calif.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Calif.

HERCULES

XR55-4

ROEPRENE MINE LOCOMOTIVE CABLE

FOR

BONUS

MILEAGE

YOU'LL GET A LOT MORE MILEAGE with Roeprene Mine Locomotive Cable... long-run dollar savings that can't be otherwise obtained. The tough Roeprene outer jacket of this cable, cured under lead, resists severe abrasion and cutting. Acids, oils and alkalis do not affect it.

For top flexibility and longest flex life the tinned copper conductor is formed into rope strands. What's more, the conductor is insulated with a rubber compound that has high resistance to heat and moisture... woven cotton reinforcing is imbedded in the insulation and jacket to bond the cable into a compact, cohesive unit.

Order Roeprene Mine Locomotive Cable from your mining distributor... see for yourself how it boosts mileage and cuts replacements.

ROEBLING ELECTRICAL WIRES AND CABLES ARE AVAILABLE WITH EITHER COPPER OR ALUMINUM CONDUCTORS

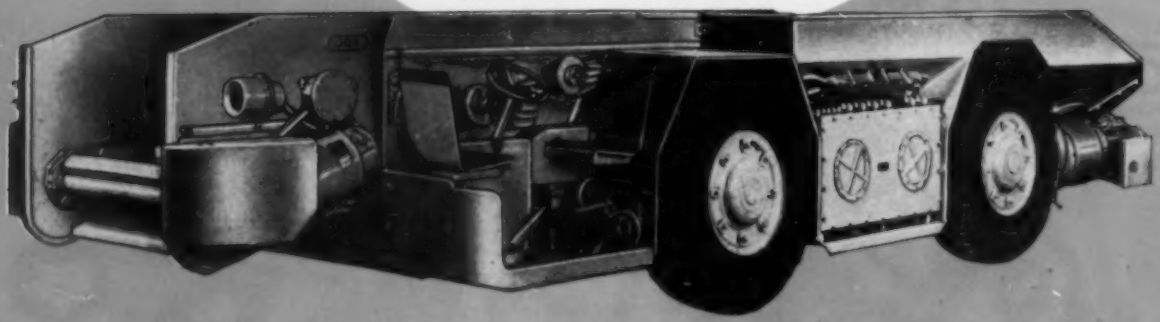
ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 11-15 STILLING ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, 1723 HENRY W. OLIVER BLDG. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

THE JOY 10-SC SHUTTLE CAR...

★ Won't slap on bumps
★ Won't skid on grade turns
★ Gets out of bad spots with ease
★ Readily trams up a 12% grade



The improved Joy 10-SC Shuttle Car is available as a Permissible or Non-Permissible unit, for net payload capacities up to 10 tons. It is built in 43", 48" or 54" heights (machine only) and may be equipped with 4", 6" or 8" sideboards. Tramming speed loaded is approximately 4.2 m.p.h., and the unit is equipped with Joy-pioneered hydraulic cable reel, and hydraulically adjustable elevating discharge.

NOW AVAILABLE—SUPER 10-SC

Special 10-SC with two 25 HP motors and heavier wheel units is now available for heavy-duty application on excessive grades. Field-tested in a Utah mine.

CAN MAKE MONEY FOR YOU!

It gets from the Face

to the

Discharge

Point and back again

faster than any

other car on the market

This latest model 10-SC is away out in front—more than ever before the world's leading shuttle car for heavy-duty, high-production service. Particularly ideal for full-seam mining because it can handle full loads of coal or rock with equal ease, the 10-SC Shuttle Car is now capable of new potentials in productivity, maneuverability, and dependable performance with lowest maintenance.

MORE ROUND TRIPS PER SHIFT

This improved shuttle car can travel, discharge and return faster than any other car in its class. That means more pay-loads per shift—and it may also mean more efficient use of other equipment, such as Continuous Miners, Loaders, Belt Conveyors, etc.

15 HP traction motors of new design provide more dependability and more reserve power for increased speed, maneuverability and carrying capacity. Wheel units and brakes are of over-capacity size for continuous heavy-duty service, and the gearing and frame are also over-capacity. Higher speed conveyor discharge, with higher-HP motors, actually gets discharge time down to three-quarters or half the time formerly required.

OTHER JOY-PIONEERED FEATURES

As in previous models, the 10-SC has 4-wheel positive steering, 4-wheel drive and 4-wheel brakes. The hydraulic "power steering" innovation in the automotive world has been a standard patented feature of Joy Shuttle Cars for years . . . one of the reasons for their high maneuverability.

The 10-SC's smooth, grab-free disc-type brakes (the type widely used on aircraft) were also pioneered by Joy for underground use. They provide exceptional stopping power with extreme simplicity and low maintenance . . . ideal for mining use because they're unaffected by dirt, coal dust, oil or water.

Other features of the new 10-SC include: improved arrangement of operator's controls for fool-proof driving; improved "zone" lubrication for fast, easy servicing; the famous Joy "Magnetax" controls, etc.

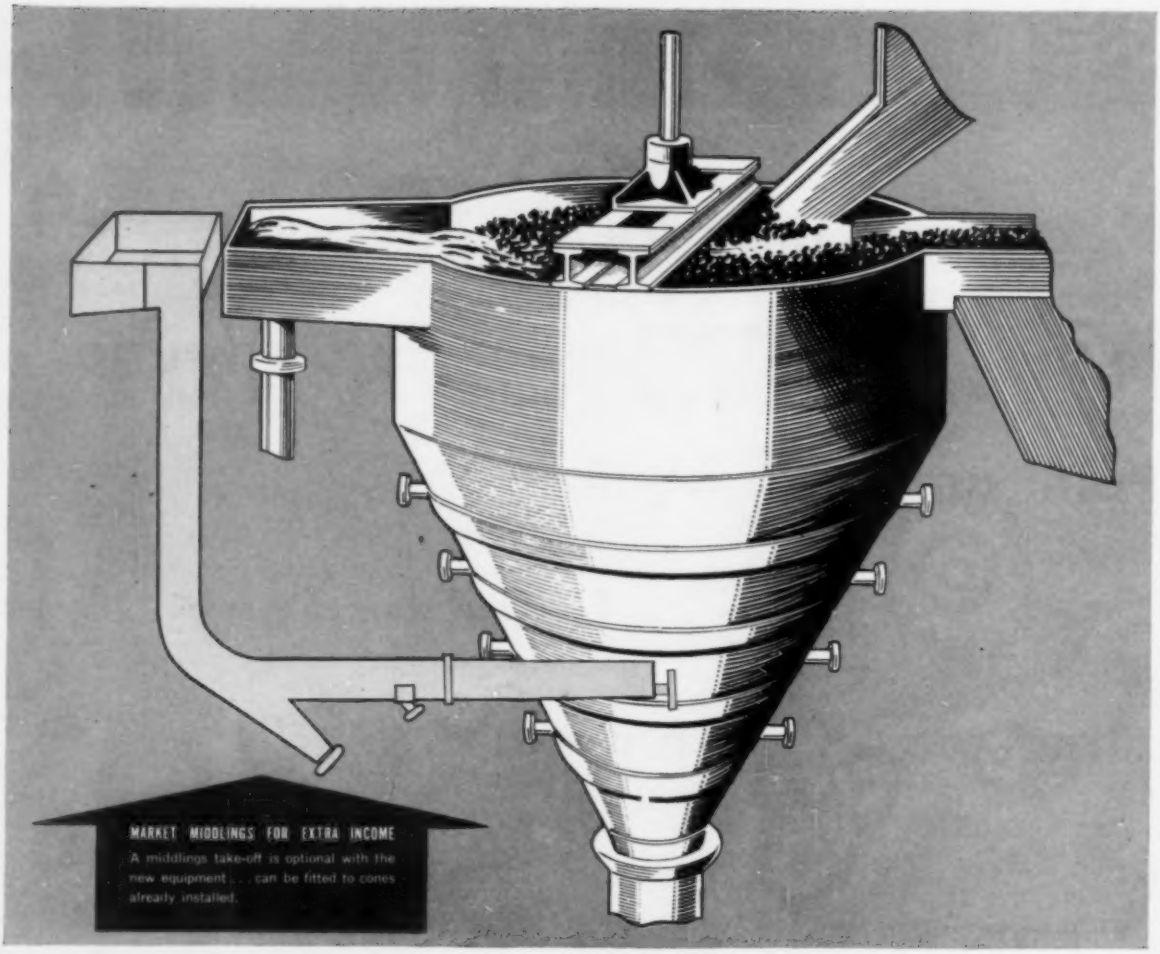
● For full data, address ***Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa. In Canada:*** *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

W&D CL5979-31


MARKET MIDDLINGS FOR EXTRA INCOME
A middlings take-off is optional with the new equipment . . . can be fitted to cones already installed.

Time after time, industry leaders choose the Chance Coal Cleaning Process

One of the finest recommendations for the Chance Process is our record of repeat orders. Again and again the big and expanding producers of the industry have reordered Chance Sand Flotation Process equipment.

Today, in use in all the major coal producing countries of the world, Chance Cones are cleaning in excess of 130,000,000 tons of coal annually — *at minimum cost per ton.*

Regardless of the size of your operation or what your coal cleaning problems may be, the Chance Process offers an economical way to get accurately sized, well-cleaned coal. Why not invite our engineers to study and discuss your requirements.

Here Are Some Advantages of the Chance Coal Cleaning Process

High Separating Efficiency

. . . Close to 100% recovery of salable coal

. . Washing gravity not affected by fluctuating rates of feed

Wide Flexibility

. . . Coal handled at gravities from 1.35 to 1.65 with sizes from 1/8 in. to 10 in.

. . . One man can change washing gravity in 5 minutes

Economy of Operation

. . . Heavy, well-built equipment assures troublefree performance

. . Equipment requires only part-time attention of one man

UNITED ENGINEERS

& Constructors Inc

U.E.&C. (Canada) Ltd.

New York 17 • PHILADELPHIA 5 • Chicago 2

WHAT DO TRUCKERS WANT MOST?

FLEET OPERATOR: *"Our trucks must be on the job earning; not in the shop costing."*

MAINTENANCE MAN: *"My job is to hold truck operating and maintenance costs down to rock-bottom."*

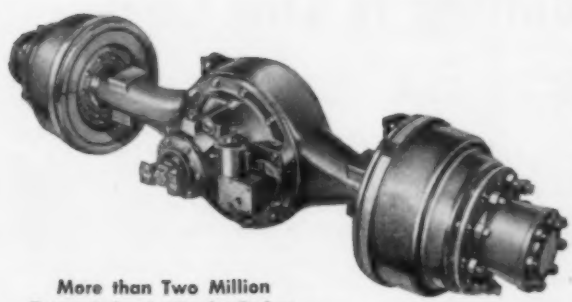
FARMER: *"Quick trips with full loads often make the difference between profit and loss on a whole crop."*

CONTRACTOR: *"We need power for tough off-highway work; and speed to go on the open road."*

EATON 2-SPEED AXLES SATISFY THEM ALL!

DRIVER: *"Every driver wants simple shifting, which means an easier-handling rig."*

DEALER: *"Higher resale values permit higher trade-in allowance — that makes satisfied customers."*



More than Two Million Eaton Axles in Trucks Today. For complete information, see your truck dealer.

Operators, drivers, maintenance men, dealers—just about everyone connected with any phase of motor truck operation agrees that Eaton 2-Speed Axles pay for themselves many times over. By providing the right gear ratio for every operating condition, Eaton 2-Speeds make trucks easier and safer to drive, reduce operating and maintenance costs, add thousands of miles of trouble-free life, and make them worth more on the trade-in.

EATON — *AXLE DIVISION* — **MANUFACTURING COMPANY**
CLEVELAND, OHIO

PRODUCTS: Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps Motor Truck Axles • Permanent Mold Gray Iron Castings • Forgings • Heater-Defroster Units • Automotive Air Conditioning Fastening Devices • Cold Drawn Steel • Stampings • Gears • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Latest Stoper Drill Development Simplifies Roof Bolting in Low Coal

Le Roi-Cleveland S-20 Vac-Nu-Matic stoper, with new feed principle, is only practical machine in seams from 36" down to 26". Other sizes available for any seam height.

28-inch feed S-20 weighs only 65 pounds. It is the lightest dust-collecting type stoper available—operators say it's easier to use.

The revolutionary S-20 stoper is designed especially to provide a better way of producing roof-bolt holes.

Low coal or high coal makes no difference to this machine. It lets you put your roof-bolts wherever you need them — even in 26-inch coal. And high drilling speed along with light weight and a positive dust-collection system helps your miners get the work done faster.

New feed principle provides low overall height and longer travel. The S-20's feed consists of an air piston combined with a chain in such a way that the travel of the machine is double the travel of the feed piston. As a result, it drills a deeper hole with one steel change than a standard stoper does with two changes.

Because it does away with at least one steel change and in some cases two, this longer travel saves roof-bolting time.

The low overall height is obtained because the S-20 is the only stoper that starts its feed at the bottom of the machine. The starting height, regardless of feed length, is always 16½ inches.

Dust collection is instantaneous. There are no hoods or tubes to handle or adjust, when your miners use the S-20 Stoper. The cuttings and dust are pulled through the drill steel instantaneously and ejected through the side of the chuck housing into the dust box—no cuttings go through the machine itself.

There's complete absence of dust because the S-20 system pulls a high vacuum. It uses only 18 cu. ft. of air at 80 lbs. pressure to pull a static vacuum of 16½ inches of mercury or a fluid vacuum of 13 inches while the machine is running. Wet top presents no problem.

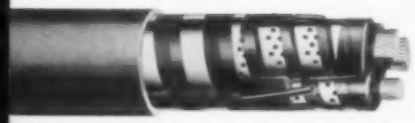
New design speeds roof-bolting operation. The S-20 has been in the field for more than a year, working in all types of coal mines. According to the evidence piled up during this period, S-20 users not only roof-bolt areas heretofore impossible to get at — they also do the work faster.

Features that contribute to this increase in efficiency are: Lighter weight. Low overall height. Longer feed. Positive dust-collection. Fast drilling speed.

Test the S-20 in your mine. See how it reduces roof-bolting costs. A demonstration can be arranged by contacting Schroeder Brothers, 3116 Penn Ave., Pittsburgh, Pa.; Acme Machinery Co., Williamson, West Virginia; Equipment Service Co., Inc., 617 North 9th St., Birmingham, Alabama. Or, you can contact us direct.

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

A brief summary of Tiger Brand Electrical Wire & Cable

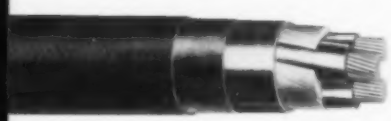


TIGER BRAND PAPER CABLE

Premium quality cable for high voltage use. Lead sheaths are applied under high pressure to insure dense surface. Lead tanks are kept under inert atmosphere to prevent formation of impurities. All constructions available, including type GN glass, neoprene fabric jackets.

TIGER BRAND ASBESTOS CABLE

On these cables, we do *not* apply the asbestos as a twisted yarn, because the yarn will frequently open when the cable is kinked. Tiger Brand cables feature asbestos that is combed and carded, then applied as a true felt which is compressed tightly around the conductor.

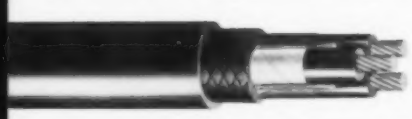


TIGER BRAND VARNISHED CAMBRIC CABLE

This is the great "in-between" insulation, for use where you want greater moisture resistance than paper has, and higher voltage ratings than offered by rubber insulations. In dry locations, varnished cambric can be used without a lead sheath, because it is not subject to oil drainage.

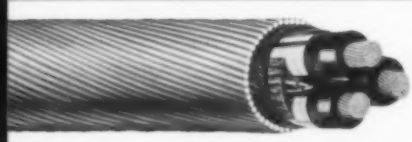
TIGER BRAND RR CABLE

Features rubber insulation and a neoprene sheath. A versatile cable—with heavy jackets—it can be buried directly in the earth. It is perfect for conduit wiring when supplied with a thin sheath. When several RR cables are combined with a bare messenger, you have a self-supporting aerial cable.



TIGER BRAND AMERCLAD

The very highest quality in *heavy-duty* portable cords and cables. All jackets are vulcanized in a lead sheath, and are permanently marked with molded identifications. High neoprene jackets show phenomenal resistance to abuse, sunlight, grease, oil or acid mine water.



TIGER BRAND SUBMARINE CABLE

Many Tiger Brand submarine cables are still in service after 30 or more years. Heavy galvanized steel armor wires are applied with long lay to resist tensile stress. AS&W pioneered in construction of aluminum armor for salt water use.

TIGER BRAND INTERLOCKED ARMOR CABLE

Available up to four-inch core diameter, with armor of steel or aluminum. Eliminates costly conduit bending and fitting. Splices can be made anywhere along the cable's length. A great money saver for plant wiring installations, especially in cramped quarters.

TIGER BRAND ELEVATOR CABLE

Cables are carefully designed to have just the right degree of flexibility so they will bend easily at the bottom of the shaft, but not so sharply that the wires will be deformed. We also supply a complete range of annunciator, lighting and signal cable, plus hatch wire for elevator shafts.

A Standard Tiger Brand Cable for every special job

AMERICAN STEEL & WIRE DIVISION • UNITED STATES STEEL

USS Tiger Brand Electrical Wire & Cable

Johann Gerdes) had tried all sorts of wire drawing tricks. He used dozens of different die lubricants, weird types of dies, slow pulling, fast pulling, high and low temperatures. Nothing worked, so you can hardly blame him for picking up the bundle of steel rods and marching outside with them. There, he flung open the door of what might be loosely called the gents' rest room, and dumped the rods down the hatch.

Some time later, they needed more rods for the experiment, so a few hardy souls retrieved the ones that had been banished in such a dramatic manner. The rods were carried back into the little factory and they drew beautifully—the first drawn high carbon steel wire. Some profound change had taken place in the steel. They didn't know what had happened, but they liked the results.

A thriving industry grew up in Altena. And they say it was quite a sight to see the workers come in of a morning with a yoke pole across their backs, supporting a lunch bucket at one end and a common household utensil at the other—the raw materials for a day at the wire mill.

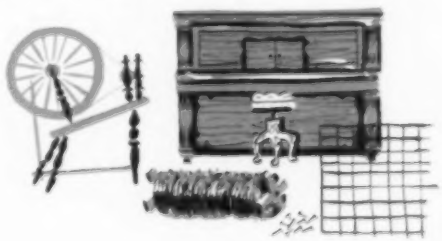
Altena enjoyed a complete monopoly on steel wire drawing for almost a century, until an obviously disgruntled worker found that dilute sour beer would also do the job. Finally, some kill-joy discovered that you could even use *water* if you did it right. The "secret" spread, and from then on, Altena had to bask in her rather impressive past glory.

On this 125th anniversary, we think we are entitled to mention that American Steel & Wire is a highly reputable organization employing about 30,000 devoted workers who really know how to do things to wire. The original company was formed in 1831 by two live-wire gentlemen named Ichabod Washburn and Benjamin Goddard, who, if they lived in this wonderful generation, would probably own half of the United States and Canada. Brilliant as these gentlemen were, the company never really started to roll until ladies became interested in hoop skirts, because this was the first true volume market for wire!

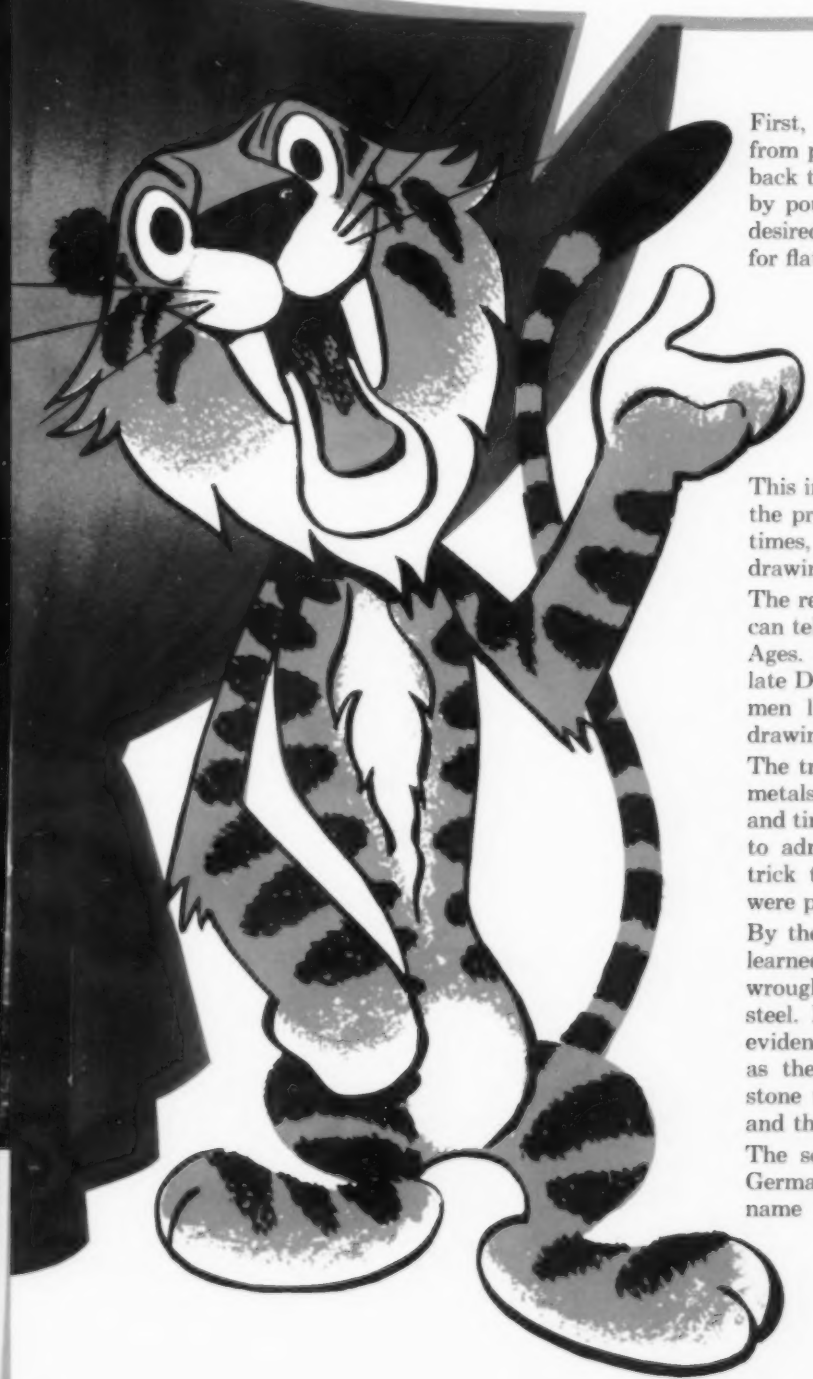
After the Civil War, the hoop skirt market went to pieces (you know how women are about fashion), and things looked pretty gloomy until barbed wire was invented around 1870. It's been one thing after another right up to the present time.

As the most knowledgeable wire maker in the USA, it was rather natural for us to begin making electrical wire and cable right at the beginning—1891 to be exact. Our salesmen frequently stumble across Tiger Brand electrical cable that has been buried in the ground or under water for 30 to 40 years and is still giving good service.

When we discuss incidents like this at our frequent sales meetings, the general comment is that our high production standards certainly don't help our replacement market very much, but fortunately, we're part of a great and growing industry. And, what with nuclear power plants and the like, there will always be a big demand for Tiger Brand Electrical Wire and Cable from buyers who want that extra margin of quality that we learned to build into our products a long, long time ago.



Did you ever hear the incredible, staggering, marvelous story of how they learned to draw steel wire? Since this is our 125th anniversary, it seems an appropriate time to let you in on one of the most underplayed industrial dramas of all time.



First, a little background. Wire, mostly made from precious metals, has been found that dates back to the year 2750 B.C. It was usually made by pounding on a bar with a hammer until the desired shape was obtained. They usually settled for flat wire.

This inefficient production method gave chills to the production men even back in the Pharaohs' times, so the race was on to find a method of drawing wire through dies.

The records are kind of sloppy, but as far as we can tell, the big break-through came in the Dark Ages. Some authorities further refine it to the late Dark Ages; but suffice it to say that learned men like Theophilus were writing about wire drawing in the period from 800 to 900 A.D.

The trouble was that they could only draw soft metals like gold or a then-popular alloy of lead and tin which we know as solder today. You have to admit that it doesn't seem like much of a trick to draw *solder* through a die, but things were pretty tough in those days.

By the beginning of the 17th century, men had learned how to draw still harder metals, like wrought iron. But *nobody* could draw high carbon steel. Not that they didn't try. There is some evidence that men searched for a drawing process as they searched for the elusive philosophers' stone that would transmute lead into gold . . . and they met with the same success.

The scene shifts to the little town of Altena, Germany, around the year 1650. Our hero (his name is in dispute, but it was probably one

AT LAST! An excuse
to tell
our favorite story!

Loading from hopper, C Tournapulls carry 18 tons per load. Average loading time was 26 seconds . . . 1.6-mile cycle was completed in 9 minutes.

"Twice as much material . . . twice the distance . . . at half the cost"

New 18-yd. FULLPAK: All-new lower, wider C Fullpak Scraper loads faster, easier . . . hauls even more heaped pay-yards than rigs shown in this job report. New Fullpak design packs load in corners, gives live boiling action that heaps 18-yd. pay-loads fast for greater yards-per-hour dirt-moving profits!

That's how Peter Debaldo, of Debaldo Bros., Glenshaw, Pennsylvania, compares his C Tournapulls to trucks on the removal of "boney" waste material at a progressive coal mine in Hammarville, Pa. After the waste material is separated from the coal it is carried by conveyor to a hopper for loading. Here's how 2 rubber-tired C Tournapulls speed this disposal.

18 tons per load

Each "C" drives beneath hopper-bin where "boney" material is stored. Operator gets out and pulls hopper-lever, loading about 18 tons into scraper-bowl. After loading, "C" hauls about 0.8 mile to waste-dump area, where it spreads the "boney". Haul, which is up grades to 13%, is dusty during summer months . . . muddy and slick at other times.

2000 tons daily

The "C's" haul and dump about 2000 tons of waste material daily. Because of their speed and versatility, cycle time (including 26 seconds to load) averages only about 9 minutes on the 1.6-mile trip.

With coal mining operations on a 24-hour day basis, the "C's" are kept busy loading and hauling most of the time. The only time Tournapulls are idle is when waste material is removed from bins faster than mine can supply it.

Likes "C's" performance

Owner Debaldo said, *"No other machine can compare to the 'C' in hauling the amount we do over these haul roads."* Chief Mechanic Chester Aber added, "These 'C's' are the easiest machines to maintain."

Why not find out how the versatile "C" can save time and money for you? Ask us now about the new, bigger, 18-cubic-yard C Fullpak Scraper, too. It's an even better dirtmover! We'll be glad to give you facts and figures on these high-production rigs any time.

Adams 440 motor grader maintains mine haul road. Despite heavy muck, which made road slick, the 440 kept roads smooth and level.

Spreading on the run, C Tournapull dumps 18 tons of "boney" material in smooth layer at waste-dump in a matter of seconds.

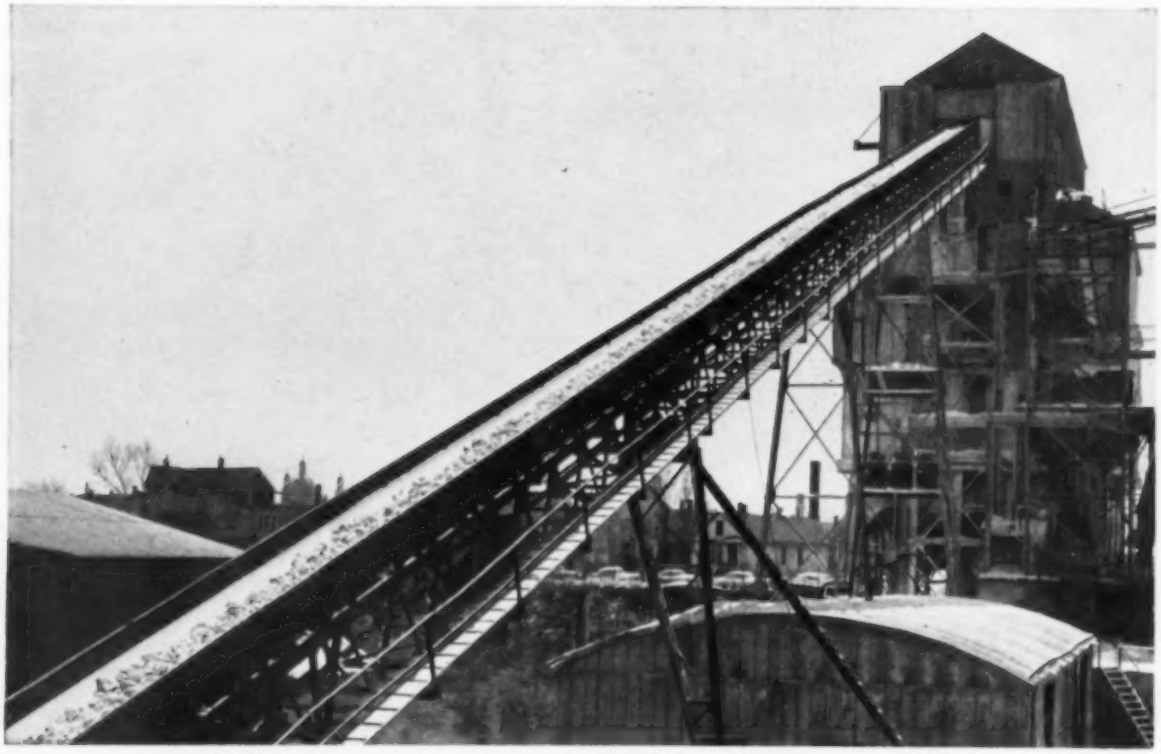
Fullpak—Trademark, Tournapull—Trademark Reg. U.S. Pat. Off.

P 296-M-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA See you at the ROAD SHOW • Chicago • January 28-February 2, 1957



Barber-Greene Idlers provide extra years of low cost operation . . . the ultimate in belt protection.

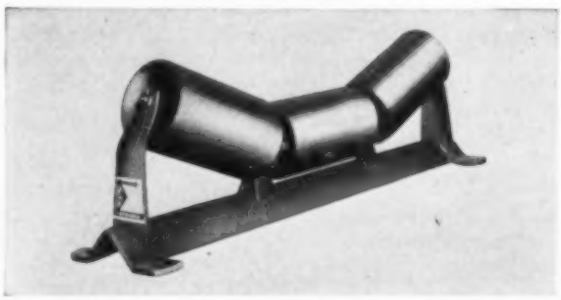
Barber-Greene Idlers . . . still rolling after twenty years

Installed 20 years ago, Barber-Greene Idlers are still rolling at this Material Service Corporation plant in Chicago.

There are no secrets behind the long-life records established by Barber-Greene Idlers. Advanced design plus top-quality materials, plus precision manufacture with the most modern production machines make the difference. The user benefits in lower maintenance costs, less down time, and longer idler life.

Barber-Greene advantages include virtually unbreakable jig-welded base frames, self-shedding base angles, interchangeable rolls made of heavy steel tubing, seamless steel grease reservoirs of ample capacity, and two-degree tilt to facilitate belt alignment.

Whether it's a ball bearing unit for normal service, or a roller bearing unit for the most rugged conditions, Barber-Greene has the idler that's right for any conveyor . . . right for any job.



Available in widths from 16" to 60", with 4", 5", or 6" rolls, the Barber-Greene line includes standard troughing carriers and return rolls, flat belt and picking table carriers, self-aligning carriers and return rolls, grain idlers, rubber impact carriers, and self-cleaning return rolls.

Write for literature on the complete Barber-Greene idler line.

Barber-Greene

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

No stops for shifting . . . *no lost momentum . . .*

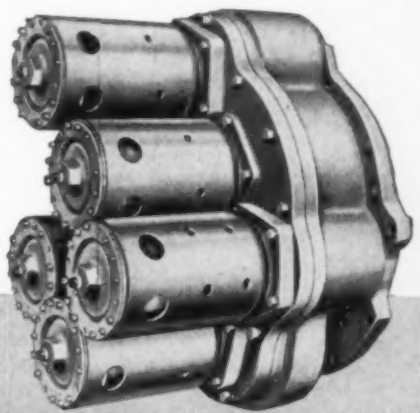
any gear ratio instantly with Constant-Mesh Transmission

Constant-mesh transmission makes a major contribution to Tournatractor's high-speed performance. It gives faster pickup for pushing or pulling scrapers, or other loads . . . permits easy synchronization of Tournatractor speed and power with that of the scraper prime-mover so two engines work as a team for fast pusher-loading. It helps you take full advantage of Tournatractor's new high speeds to handle more jobs, get more work done.

With constant-mesh transmission you eliminate depressing of a clutch foot-pedal. You have no double clutching . . . no synchronizing for meshing of one gear against another. Quick movement of a small speed selector lever transfers power instantly from one gear ratio to another.

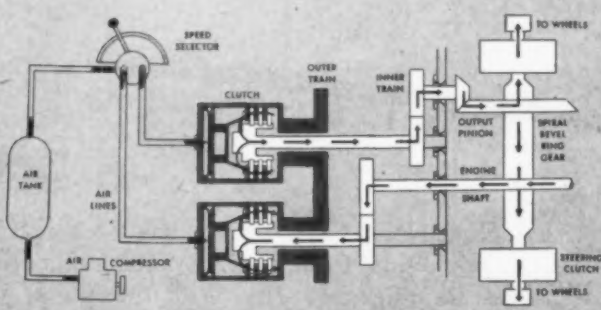
Tournatractor transmission is fully enclosed and operates in a bath of oil. All adjustment and lubrication points are conveniently located for quick, easy accessibility.

Call us to arrange a demonstration on your job. See for yourself the advantages you get from Tournatractor's constant-mesh transmission, 208 hp, 17 mph speeds, and rubber-tired mobility. See also how Tournatractor's optional, trouble-free, low-pressure torque convertor gives you the additional advantage of maximum horsepower at all times over the complete speed range.



Transmission Clutches Air-Actuated for Instant Control

Constant-mesh transmission and air clutch assembly are installed as a single unit. Clutches are mounted individually on ends of the gear shafts. Each 7" multiple disc clutch has 290 square inches of gripping surface. These heavy-duty clutches engage and release in proper combinations at a touch of the control lever. To make clutch adjustments all you do is loosen a few Allen-head screws and turn adjusting ring "in" or "out." Tournatractor also has 2 air-actuated steering clutches which are similar in principle.



Arrows trace power-flow through CONSTANT-MESH TRANSMISSION

Tournatractor—Trademark

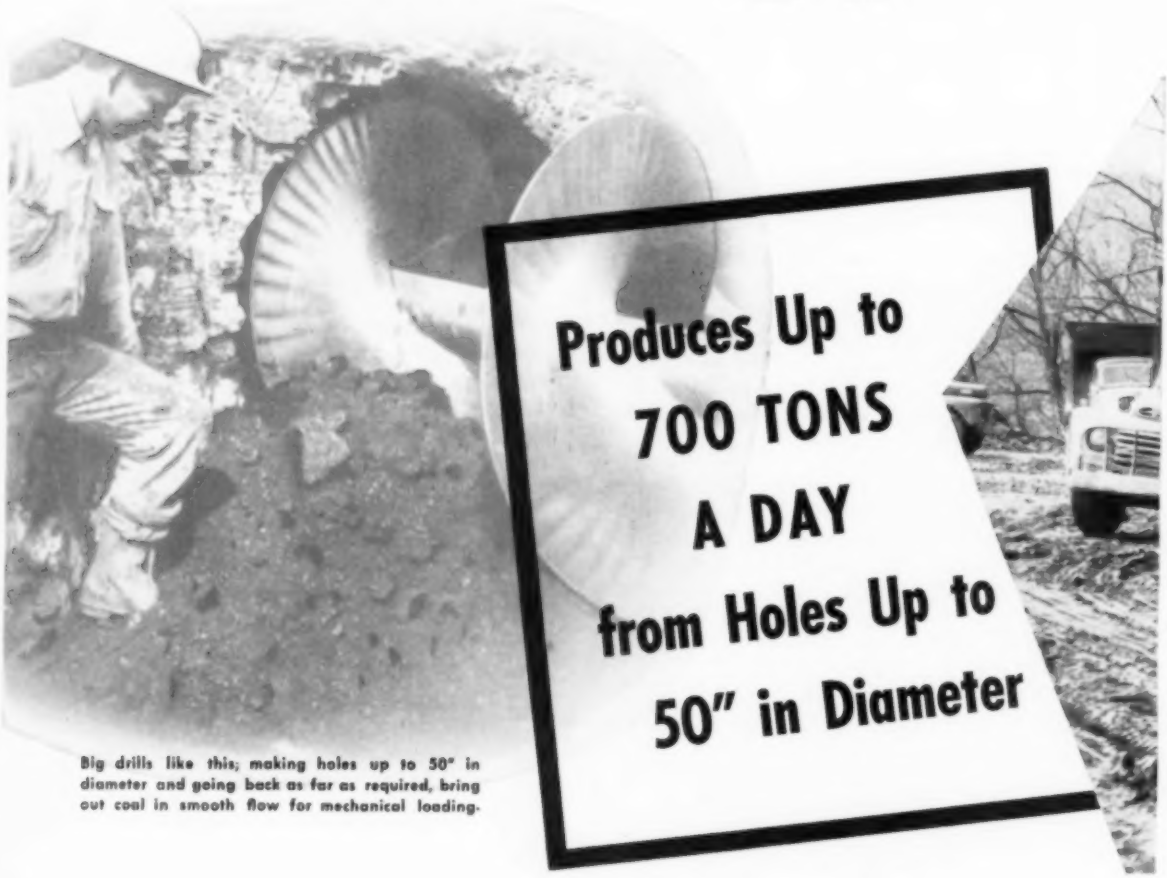
LeTourneau-**WESTINGHOUSE** Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA

See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

New-Bigger -More Rugged



Big drills like this; making holes up to 50" in diameter and going back as far as required, bring out coal in smooth flow for mechanical loading.

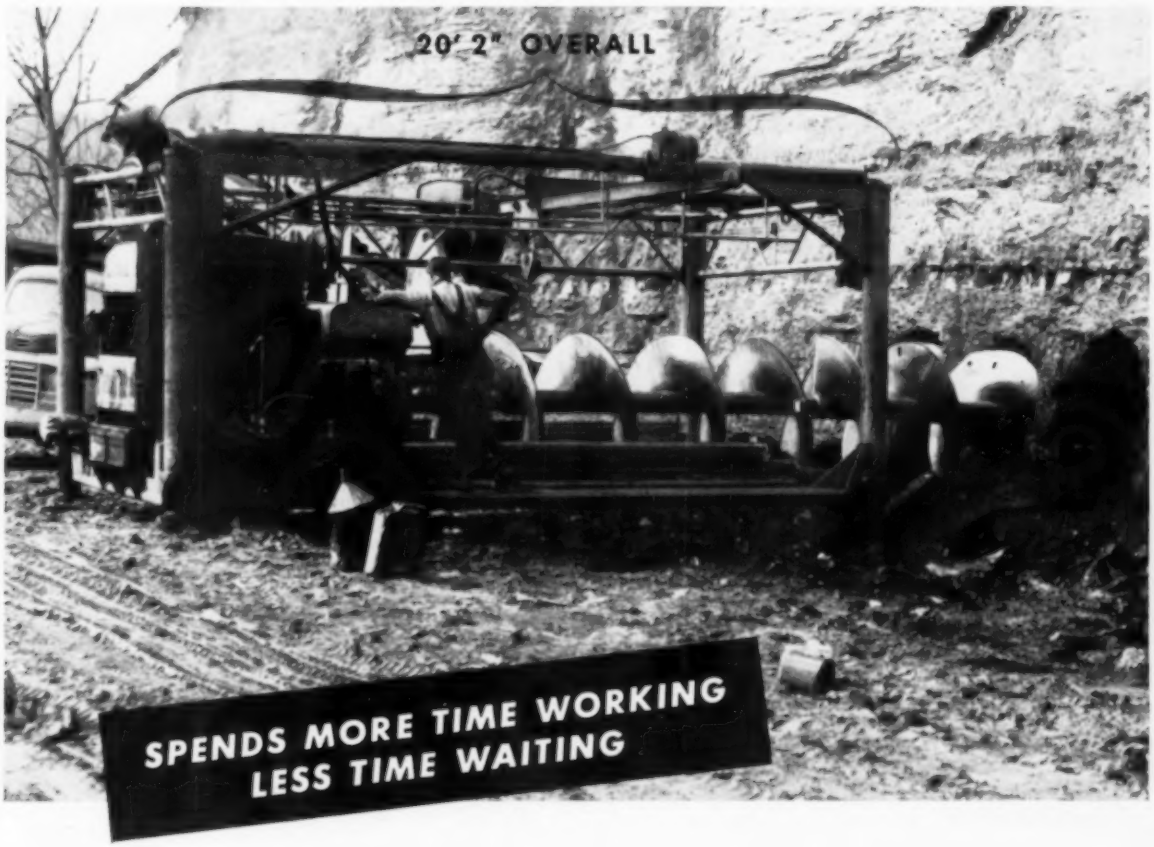
Produces Up to 700 TONS A DAY from Holes Up to 50" in Diameter

Here, we believe, is the cheapest coal mining method yet developed, on a per-ton basis. Salvaging pure coal otherwise "lost" because of excessive overburden, the new CARDOX Model 235 can operate easily in any 26-foot pit —takes only a three man team. Because it is self-positioning by hydraulic jacks and self-moving, the No. 235 spends *more* time working, *less* time moving from hole to hole. Auger changes are quick and easy. With the Auger-Miner spanning *two* holes, augers are stored in the completed hole and recovered as needed for the new hole being drilled. Its extremely rugged construction means less maintenance,

CARDOX CORPORATION

CARDOX AUGERMINER MODEL 235

for Lower Cost Continuous Surface Coal Mining



while simple design makes such maintenance easier.

Get the full facts now on how the CARDOX Model 235 AugerMiner may help you get the most economical, profitable coal you've ever mined. Write and we'll arrange a meeting with a CARDOX Engineer.

● **307 NORTH MICHIGAN AVE. • CHICAGO 1, ILLINOIS**

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Phone: Beckley 4812

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Phone: Benton 8-3821

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Phone: St. Clairsville 619

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307 Northwest Fifth St.
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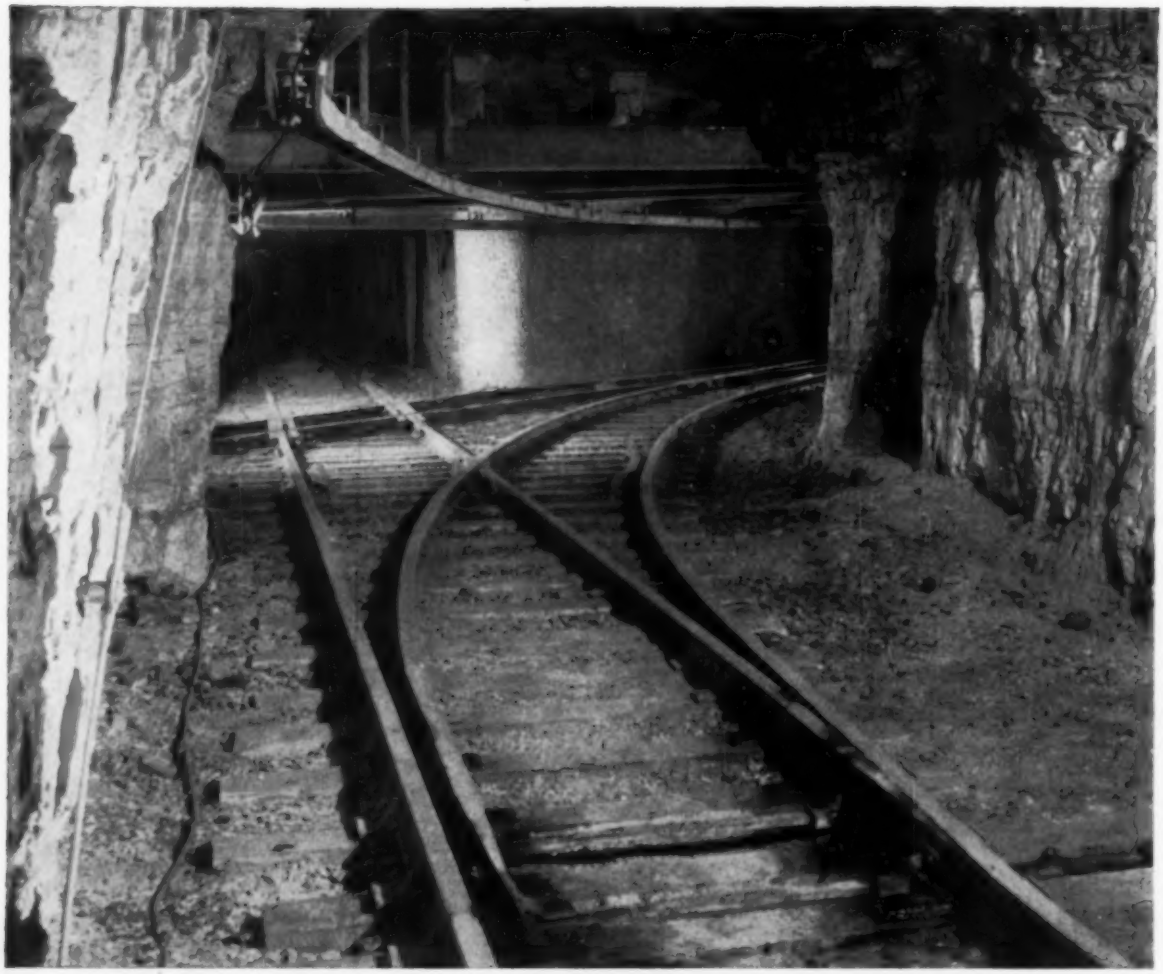

A message from a good-looking haulageway

There is far more to a good-looking layout than just appearance. Truly good-looking track carries an important message, which perhaps might run like this:

"I am rugged and strong, fully able to carry the load today, and in the heavier-tonnage days ahead. If I really do look good to my owners it's because I constantly remind them that I carry heavier trips at higher speeds without spillage or costly derailments. In other words, they look at me and forget the money I cost, because of the savings I earn.

"I was made from quality rail steel produced by Bethlehem. I was designed by experienced Bethlehem engineers who really know mining, who thoroughly studied the job I was supposed to do.

"I was carefully assembled on Bethlehem layout floors according to a predetermined plan, to be sure final installation would go along smoothly. All parts were checked for proper fit, all curves for proper radii, before a single item was shipped.

"By the time I arrived at the mine, all bugs had been ironed out, all chance of wastage virtually eliminated. Small wonder I look good to my owners, and will for a long, long time to come!"

Fanciful, yes! But the message is there to be heard by any mine that is looking to a profitable future. A Bethlehem engineer will be glad to fill you in on the details; you can reach him through any Bethlehem office, or by writing direct to us.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation.
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BETHLEHEM STEEL

BETHLEHEM STEEL

5 "Euc" REAR-DUMPS

10 to 50 Ton Capacities

for CONSTRUCTION, MINE, QUARRY and INDUSTRIAL WORK

10-Ton

Model UD has 128 h.p. engine . . . 10-speed transmission . . . 36 m.p.h. loaded travel speed . . . spring mounted drive axle with 12.00 x 24 duals.

Euclid Rear-Dump hauling units for off-highway service are available in five sizes with capacities of 10, 15, 22, 34 and 50 tons. They have diesel engines of 128 to 600 total horsepower.

The simple rugged construction of "Eucs" pays off in long life and low maintenance cost. You get more work-ability because there's less down time for repairs. There are more Rear-Dump "Eucs" in service than all other makes of off-highway haulers combined.

Have your Euclid Dealer give you facts and figures on the complete line of Rear-Dumps and other Euclid equipment . . . you may find, as hundreds of owners have found, that ***Euclids are your best investment.***

EUCLID DIVISION, GENERAL MOTORS, Cleveland 17, Ohio

15-Ton

There are two 15-Ton models with 5-speed transmission and 14.00 x 24 tires. Model FD has 165 h.p. engine, and 10 cu. yd. body. Model R-15 has 218 h.p. engine, spring mounted drive axle, power steering and 10½ cu. yd. body. Quarry body is available for either model.

22-Ton

Model TD "Euc" is equipped with 300 h.p. engine, spring mounted drive axle with 18.00 x 25 duals, power steering and 15 yd. body. Available with Torqmatic Drive or 10-speed transmission. Standard or quarry body is available.

34-Ton

Model FFD has two engines providing a total of 400 or 436 h.p. to tandem drive axles through separate Torqmatic Drives. Dual tires are 16.00 x 25. Exhaust heated body has 24-yd. capacity.

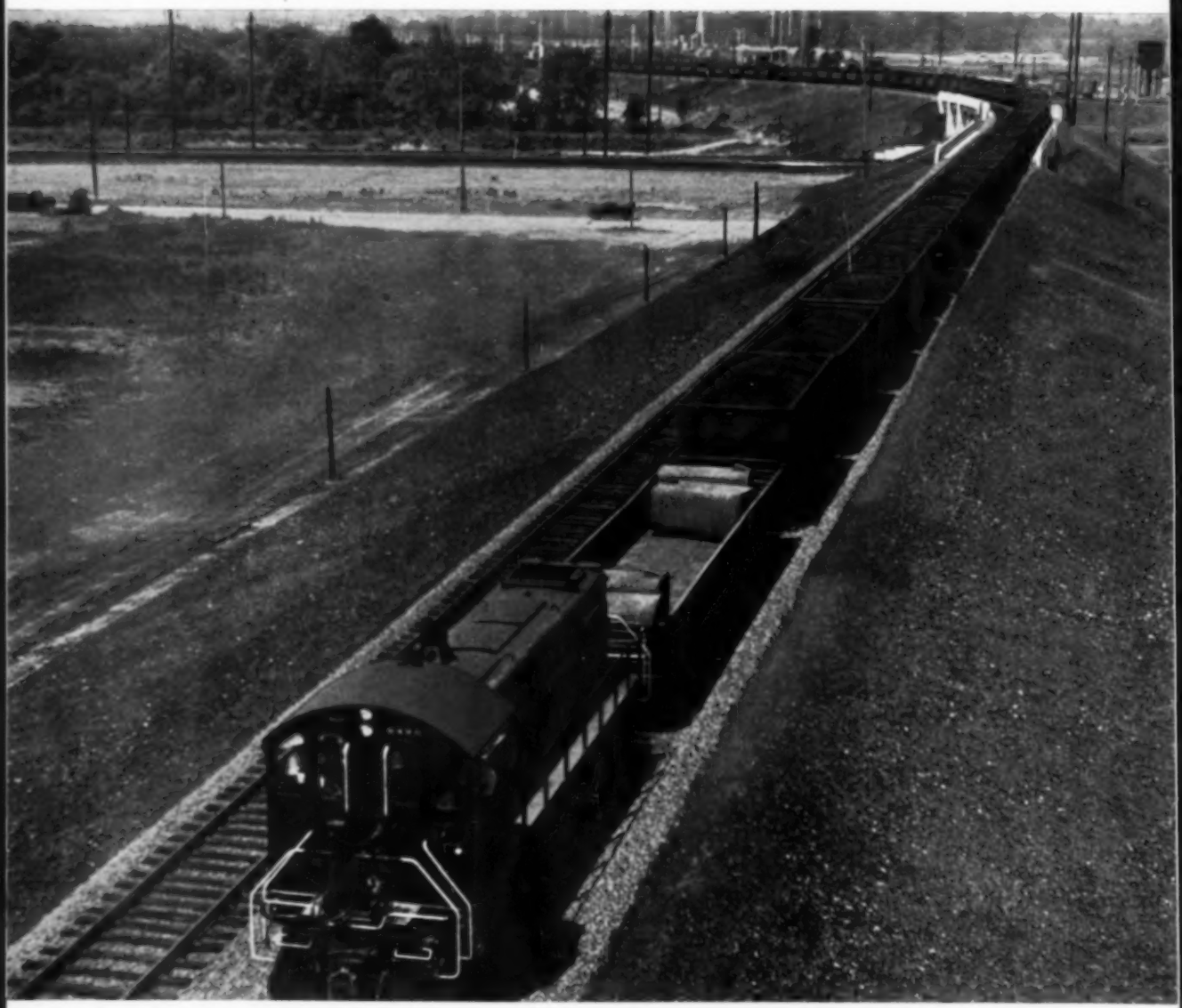
50-Ton

Similar in design to the Model FFD "Euc", the 50-ton Twin-Power Model LLD has a total of 600 h.p. and an exhaust heated body with 32-yd. capacity. Tires are 18.00 x 33.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

With the help of our coal shippers and users, ten hoppers are now doing the work of eleven in meeting increased demands for coal



Keeping hopper cars on the move, eliminating delays, putting solid coal trains on fast freight schedules are some of the Pennsylvania's answers to the problem of finding enough hoppers to meet greatly increased demands for coal.

We thank coal shippers and users for loading and unloading promptly, making turns in the shortest possible time, a most important factor in keeping cars on the move.

Last year our hoppers made approximately two round trips a month. This year we're shooting for 2½ round trips. That's the equivalent of an extra 13,000 cars.

Two thousand new hoppers costing almost $16 million were put in service in June. Another 2,800 will be built as soon as steel can be obtained. Five of the Pennsy's big shops are turning out 79 fully reconditioned hoppers a day.

Meanwhile, every effort is under way to create more car capacity by keeping hoppers on the move. Two hours terminal time saved on a string of 100 empties means 200 additional car hours, just like having eight additional cars for a full day's work. Even 15 minutes a day added to the running time of the average hopper makes 10 cars do the work of 11. That's why everybody's cooperation is appreciated.

Pennsylvania Railroad

Valve on left is from compressor run for 3,000 hours with well-known, high-grade oil. At right is same valve after a 3,000-hour run with Sun Solnus oil. Note difference in carbon deposits.

3000-HOUR TEST PROVES SUN SOLNUS OILS REDUCE CARBON BUILD-UP IN COMPRESSORS

Equipment: A three-stage Norwalk horizontal-type compressor. Operating pressure: from 1,000 to 1,500 psi.

Test: The compressor was cleaned thoroughly and filled with a well-known, high-grade oil. The equipment was run for 3,000 hours, then torn down for inspection and cleaning. Then Solnus® 300 was tested in the same way.

Results: Look at the two pictures. You can see for yourself how Solnus oil reduced dangerous carbon build-up.

All types of reciprocating air compressors that have been changed over to a Sun Solnus oil show similar results. A test in your compressor will show the same remarkable reduction of carbon deposits.

You can get a technical bulletin about Sun Solnus oils by asking your Sun representative, or write to SUN OIL COMPANY, Philadelphia 3, Pa., Dept. I-52.

SUNOCO®

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY PHILADELPHIA 3, PA.

© SUN OIL CO.

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL

Every winter, more and more progressive operators are treating their coal with Sterling Rock Salt. This modern practice builds good customer relations by preventing shipments from freezing . . . speeds turn-around of cars.

Here are some other important reasons why *you* should use economical Sterling Rock Salt this winter: Sterling Rock Salt is simple to apply, handles easily, is harmless to hands and clothing, stores without loss. And it dissolves slowly, to give long-lasting antifreeze action. You can also use Sterling Rock Salt to prevent frozen scales and switches . . . and to keep roads and yards clear throughout the winter. It removes snow and ice *fast*.

Order Sterling Rock Salt now—regular or "Inhibium Treated" to prevent corrosion of metal equipment. International's strategically located mines are ready to give you fast shipments in bulk, or handy 100-lb. bags.

INTERNATIONAL SALT COMPANY, INC., SCRANTON, PENNA.

Sales offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N.J.; Buffalo, N.Y.; New York, N.Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; and Richmond, Va.

How the Piggyback Conveyor System... keeps continuous mining machines working more hours per shift

Third Pass
Second Pass
First Pass
Continuous Mining Machine (Any Type)
Approximate length . . 30'
LONG Model "88" Pigloader*
Receives directly from miner . . . serves as a mobile conveyor . . . provides mechanical cleanup and surge capacity . . . trams Piggyback* Conveyor.
Approximate length . . 17'
LONG Piggyback Conveyor
Transfers coal from loader into room conveyor without interruption or spillage. Pivot action of 180° at each end permits complete freedom of movement.
Approximate length . . 32'
Total Approximate Reach Away From Room Conveyor . . . . 79'
Enough to reach completely through breakthroughs, mine forward from breakthrough to breakthrough, pillar substantial blocks, etc.
LONG Mobile Chain-type Room Conveyor
Equipped with crawler-mounted, self-tramming conveyor drive, moving time is eliminated because one man can move and position this mobile head in less time than it takes to move the miner itself.
Approximate operating lengths . . . . . up to 400'.
Mobile Head
* Trade Mark
LONG Chain-type Gathering Conveyor

As many leading coal companies already know, the Piggyback Conveyor System is the most practical, most economical method of face transportation for continuous mining. Because it eliminates lost time for car changes, this continuous-flow equipment assures maximum working time at the face—makes it possible for continuous mining machines to operate more hours per shift. Coal is loaded and moved from the face to the outside in a steady, uninterrupted stream *as fast as it's mined.* The result: more tons per man, higher continuous tonnages and less cost per ton.

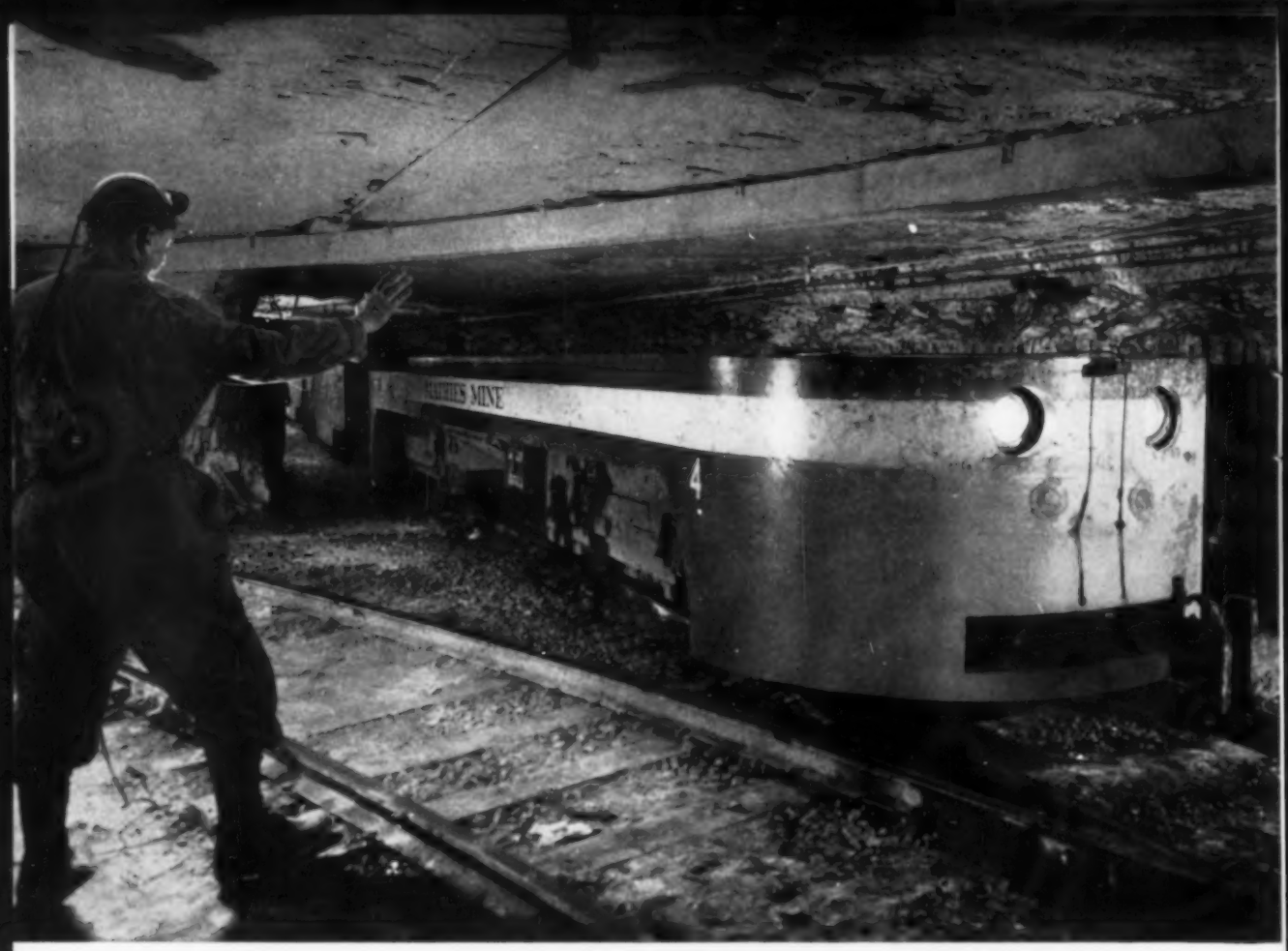
Whether you're using continuous mining machines or conventional mining units, it will pay you to consider the many advantages provided only by the Piggyback Conveyor System. We'll be glad to supply complete information—without obligation.

Check these advantages of the Piggyback System for continuous mining

Fewer delays • Higher capacity • Lower maintenance • Fewer men in face crew • Fewer nonproductive men • Less down time • Better cleanup • Better operator attention • Greater concentration of mining • Longer economical haulage distances.

Piggyback Conveyor System in operation, servicing continuous mining machine that has delivered single shift tonnages of over 800 tons. Receiving end of Piggyback is attached to Pigloader loading machine and follows it as it moves.

The LONG Company
OAK HILL, W. VA.



Mathies Mine Hauls 50% More Coal with General Electric 50-ton Mine Locomotives

Mathies Mine's three 50-ton G-E mine locomotives handle heavier loads with ease and efficiency. In fact, over-all performance of their first G-E locomotive was so good that Mathies bought two more!

The Mathies Mine in Finleyville, Pennsylvania (fourth largest coal mine in the world) daily produces 13,000 tons of clean coal. Their round-the-clock mining operation naturally requires the very finest locomotive fleet available.

General Electric mine locomotives provide Mathies Mine with these 3 important benefits:

1. **INCREASED HAULING CAPACITY**—Daily tonnage hauled has *doubled* since these locomotives were installed. Now Mathies' 2½% grades no longer impede haulage from mine to yard. Average trains number 60 cars hauling more than 800 tons per train.

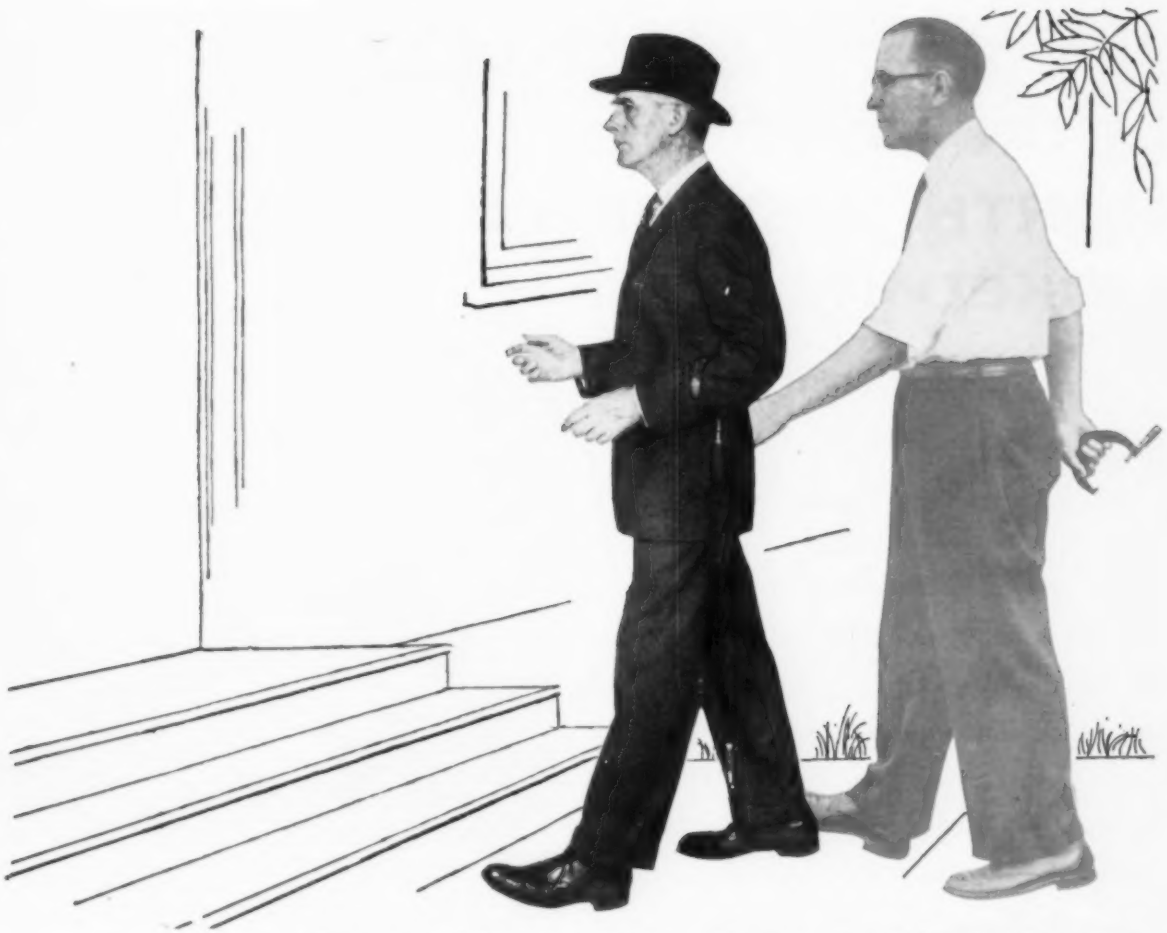
2. **INCREASED EFFICIENCY**—G-E mine locomotives are specifically designed for high-speed, heavy-duty operation. As a result Mathies now moves heavier loads faster and more efficiently than was formerly possible. Haulageway congestion and production delays have been reduced.

3. **LOWER OPERATING COSTS**—Because of their four-axle, swivel-truck design, these locomotives ride smoothly over the rails. Result? There's less pounding and jarring. That means less wear . . . less maintenance on both locomotives and tracks.

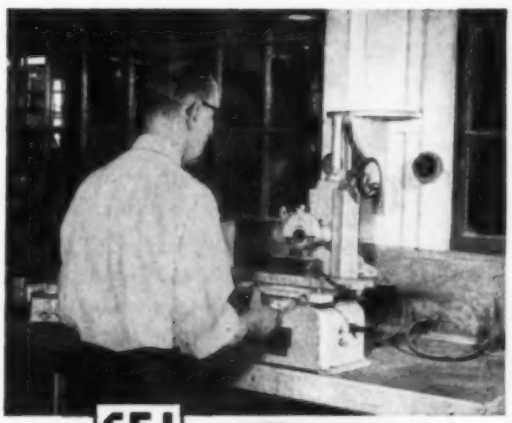
WHAT ARE YOUR HAULAGE REQUIREMENTS? From the wide range of General Electric industrial and mine locomotives—diesel-electric and straight-electric, for both underground and surface haulage—there is one fitted to your needs.

For a survey of your haulage requirements, without cost or obligation, call your local G-E Apparatus Sales Representative. General Electric Company, Locomotive and Car Equipment Dept., Erie, Pa. 120-67

GENERAL ELECTRIC



Your Wickwire Rope Distributor and our die maker... ready to serve you



This die maker—one of the skilled technicians responsible for the quality of our rope wire—is with your Wickwire Distributor every time he makes a call.

True, he's physically in our plant, working to tolerances of 1/10,000 of an inch as he fashions the super-hard carbide dies used to produce every foot of rope wire. But, whenever your Wickwire Distributor makes his call, he has the full assurance that *every* wire in the product is exactly the size it should be and has a smooth, silky surface finish. This careful attention helps assure a rope which will perform successfully.

It's just one more reason why your Wickwire Distributor knows he's got top-quality rope, slings and strand to sell . . . and that these products will serve you well.

4083

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

Widely scattered jobs a problem?

LOOK HOW NORTH WESTERN-HANNA LICKED IT!

This Milwaukee dock company has a scattered job problem that makes them real experts in the field. Their coal dock stretches for *16 blocks!* They have jobs to do at *every corner,* and to reach them, their machines have to contend with dock traffic, bridge cranes, railroad tracks, buildings, bins, city streets, and similar complications.

To get economical, fast, materials-handling under these conditions, North Western-Hanna turned to a Michigan Model 75A, with dramatic results!

Loads 7½ ton truck in 3 to 4 minutes

Many times a day, its call is to load North Western-Hanna's 7½ and 12-ton coal delivery trucks. Average loads of 10½ cubic yards take 3 to 4 minutes. 18 yards take 7 minutes. Because its bucket heaps so easily and so completely (carrying 2,400 lbs. of coal each time)—and because so little of the load spills out of its 85-inch 1½-yard light material bucket—the Michigan usually needs only six passes to heap each 7½-ton truck . . . only nine passes to load the 12-ton units. It also occasionally loads the company's giant 18-ton semis . . . heaping 27 cubic yards in about 10 minutes.

Travels job-to-job at 27 mph

Minutes after a call for service anywhere in the dock area, the Michigan is there—making a typical half-mile trip across railroad tracks, pavement, and coal pile in 1 to 2 minutes. Its top speed, forward or reverse, is 27 miles per hour (or 2,375 feet per minute).

Stockpiling— outproduces crawler, 12 to 1

In stockpiling, the Michigan moves coal from bridge cranes and dresses edges to a 3-to-1 slope. Rolling action of big tires plus ground pressure of 17 lbs. per square inch, packs coal solidly to increase capacity and greatly reduce chances of spontaneous combustion. According to Dock Foreman Rudy Perry, the Michigan works so

fast it *makes FOUR trips to every one* made by a crawler bulldozer formerly used . . . moving, because of its bucket carrying capacity, *THREE times as much coal PER TRIP!*

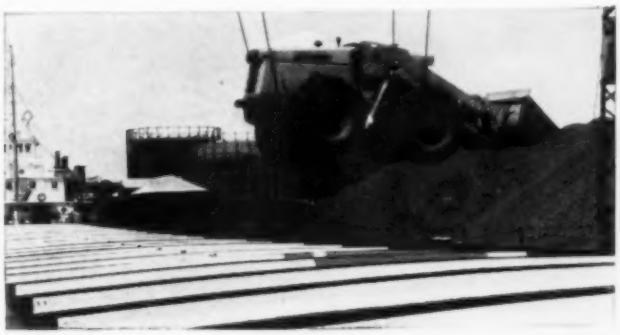
Switching— pulls 7 loaded cars

Equally impressive is Michigan's performance spotting railroad cars. At times it has pulled 7 loaded cars—all that were on hand—each car loaded with 50 to 70 tons. It spots empties, one to 15 at a time. Once it even pulled a tanker loaded with 8,000 gal. of oil (64,000 lbs.) up a slick, icy grade for 500 ft. to a drain pit.

Unloading boats— cuts time 3½ hours

When a boat comes in, the Michigan is lowered into each compartment to doze coal to the bridge crane. This method means no bucket cleanup need be used . . . also that the big crane has to be moved only from compartment to compartment—for most boats, that's three to four moves compared to 12 to 20 formerly needed. The steamer, Joseph Wood, is a good example of the saving attained. Company records, kept since 1940, show it *always took 24 hours or more* to unload the Wood's 10,200 tons.

When the Michigan went to work, unloading time slid dramatically to 18½ hours! The boat now gets back into Lake Michigan 5½ hours sooner—and North Western-Hanna saves paying time-and-a-half for 5½ hours to six men. Not only is the Michigan fast and



productive—on this job it dozes *five tons of coal per pass*—but it's the safest machine for working around big cranes, Foreman Perry says.

"You can keep foot on accelerator at all times, and still shift from forward to reverse instantly!" he emphasizes.

Carrying supplies— moves 6800 lb. load

Dozens of odd jobs, too, around North Western-Hanna's big dock and 750,000 ton stockpiles are now "Michigan jobs". Like helping clean the coal bins. Carrying 6,800-lb. overhead crane buckets to the repair shop. Moving gravel to fill road washouts. Pushing trucks.

Check Michigan advantages on your job

Mobility and output like this, we think, can help you too. For proof, we'd like to *show* you, first-hand, what Michigan Tractor Shovels can do on the only job you *really* care about—*your own!* Let us bring a demonstrator to your work area. Let your own operators run it on any task you say. Measure its output . . . compare performance . . . then pick the size you need! Seven basic models, 35 bucket sizes and attachments now available; 6 cubic *feet* to 5 cubic *yards*.

Michigan is a registered trade mark of

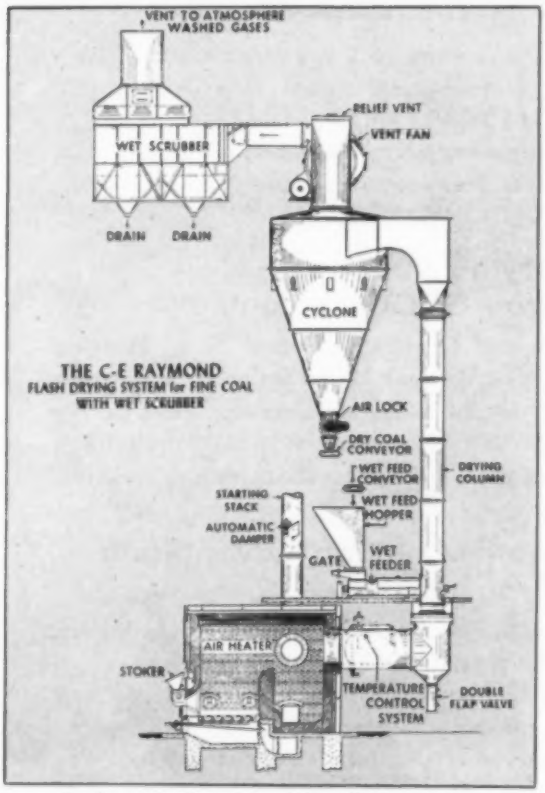
CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2473 Pipestone Road
Benton Harbor 40, Michigan

CONTROLS
AIR
POLLUTION

Raymond C-E System Flash Drying FINE COAL

ELIMINATES
COAL
DEGRADATION



Designed for large or small coal preparation plants. Single drying column for handling 10 to 100 tons/hour. Multiple columns on one furnace for larger capacities.

THE C-E Raymond System provides a complete, coordinated unit of equipment for the rapid drying of fine coal. Each installation is "tailored" to the individual plant requirements for the production of fine coal, from ⅜" or below in particle size.

In addition to high thermal efficiency, and clean automatic operation, the Raymond System offers other important advantages:—

Flexible installation, readily adaptable to existing plant layout.

Low power consumption, and minimum maintenance costs due to few mechanical parts.

Instantaneous drying and new type coal trap solve the coal degradation problem, even in the softer coals.

Special wet scrubber connected to vent system controls air pollution in compliance with smoke ordinance restrictions.

The consistent success of Raymond Flash Drying installations in economy of performance and uniformity of product makes this modern method worth your inquiry.

Write for Raymond Bulletin FD 51

We are supplying the Flash Dryers for a large pipeline project to transport fine coal.

COMBUSTION ENGINEERING, INC.
Raymond Division

1315 NORTH BRANCH ST.,
CHICAGO 22, ILLINOIS

SALES OFFICES IN
PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

PYROPRENE* BELTING FIRE RESISTANT

"Acceptance" designation: "FIRE RESISTANT, U.S.B.M. No. 28-7" January 27, 1956

FIRE RESISTANT • OIL RESISTANT • MILDEW PROOF

Want more details? Have a special belting problem? Hamilton's 86 years of experience will help you!

OVER 86 YEARS OF SERVICE TO INDUSTRY

HAMILTON RUBBER MANUFACTURING CORPORATION

Executive Offices and Factories . . . Trenton 3, New Jersey

Branches in

ATLANTA • CHICAGO • CLEVELAND • HOUSTON • PITTSBURGH
INDIANAPOLIS • LOS ANGELES • NEW YORK • SAN FRANCISCO

(PLEASE GIVE THIS ADVERTISEMENT TO YOUR BLASTING FOREMAN)

He's making a half-hitch for a fast ride . . .

He's connecting a "down" or branch line of Reinforced Primacord at right angles to his trunk line of Plain Primacord. He's using a double half-hitch, *drawn tight — because the detonating wave will take this switch at about* 4 *miles per second!*

This detonating wave is set up in the Primacord trunk line when it is detonated at one end with fuse and cap or electric blasting cap. It travels along the trunk and down to the bottom of each hole, where it initiates the detonation of every explosive in the charge. It's a pretty fast "ride" — but not too fast, because the millisecond interval between holes and rows of holes promotes relief of burden — better fragmentation — easier digging.

Remember, when you detonate with Primacord you can *fire when ready*. Because this detonating fuse is insensitive to sparks, friction, ordinary shock and stray electrical currents. Made in Plain, Reinforced, Plastic Reinforced and Plastic Wire Countered — each designed for a particular purpose.

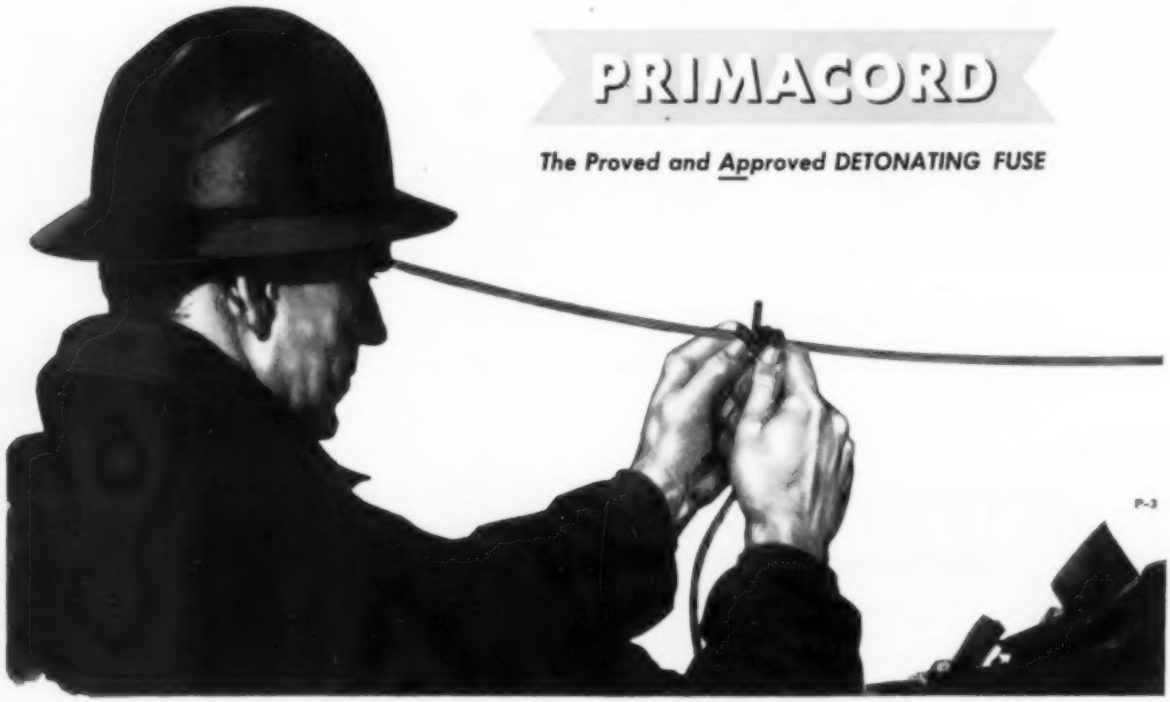
Ask your Explosives Supplier, or write to **THE ENSIGN-BICKFORD COMPANY**

Simsbury, Connecticut

Primacord • *Quarrycord* • *Ignitacord®* • *Safety Fuse* • *Blasting Accessories* • *Established* 1836

PRIMACORD

The Proved and Approved DETONATING FUSE



P-3

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

OCTOBER, 1956

IVAN A. GIVEN, EDITOR

Not Tomorrow

THE COAL FUTURE, by the very fact that it is one of growth, brings in or accentuates a number of problems. Among them are the possibility of a renewal of the race to advance wage rates faster than increases in productivity. Another is a possible decline in Congressional, legislative and administrative receptivity to industry proposals for action which only such bodies can take. Such action includes protecting the industry against unfair treatment which would reduce its ability to serve not only its rightful markets but also to meet new demands which any future emergency might bring. Then there still are the problems of freight rates, and of securing adequate prices. The latter takes on added importance in view of the increasing needs for capital that already are becoming evident.

Growing demand, therefore, does not mean that the industry can be less vigilant in attention to any of its problems, though it is to be hoped that as they are met the industry can increasingly lead from strength. One of the ingredients is skilled manpower in both the supervisory and managerial ranks, not to mention engineering which daily becomes more and more vital. As the industry moves up out of the recession which ended in 1954, and heads for higher levels in the future, manpower will become more and more critical, not only from the standpoint of numbers, but, equally or more important, quality.

Even though increased efficiency has reduced total mine employment, the number of supervisors has not gone down proportionately, reflecting the growing need for closer control of modern production units. Also, it now appears that the expected rate of production expansion will require more supervisors even if the trend toward increasing the number per given total of mine workers did not exist. Both are evident in data in the 1955 annual report of the West Virginia Department of Mines, which shows 12 men per supervisor in 1951 and 11 in 1955. It also shows that the total number of supervisors, after dropping year by year to 5,265 in 1954, began to rise in 1955 to 5,376. Field checks indicate that 1956 will witness a further—and considerably larger—increase.

But, as previously indicated, numbers are only one part of the problem. The other is quality, which depends upon natural ability, training and experience. When quality is taken into consideration, it limits the number of men that can be called back in addition to the natural shrinkage in total available after a given period of time. In short, supervisors are scarce and good supervisors are even scarcer. As time goes on, the situation will get tougher and tougher unless steps are taken to increase the number and raise the quality. Recognition of this fact is leading more and more companies into recruiting and training programs designed to find and develop good men from the employee ranks.

Good engineering and managerial talent, likewise, is scarce now and will be scarcer in the future unless the industry really takes steps to get more qualified men into the schools—and, after school, into the industry. Here, the lead time, compared to finding and training a mine supervisor, is much longer, and the pinch could well be much greater before an adequate reservoir of skill and experience is built up. From whatever the angle, the picture is one of immediate and increasing need for action if the industry is not to suffer from shortages in both number and caliber of supervisors, engineers and managers in the growth era ahead. Today —not tomorrow—is the time.

CITIES across the Nation, with increasing state and federal support, plan a firmer crackdown on air pollution. Keeping ahead of the crackdown will protect . . .

Coal's Stake In Reducing Smog

By expanding air cleanup programs now, coal will avoid the headaches of punitive legislation; gain public relations and sales benefits. Needed most: intensified effort by individual companies.

By W. A. RALEIGH, JR.
Assistant Editor, COAL AGE

A GROWING MOVEMENT against air contaminants that create a nuisance, damage property and impair health makes it vital for coal to expand and enlarge its participation in air cleanup programs. Intensified effort to solve the problems arising out of the production and utilization of coal offers the industry opportunities to:

Maintain and improve community standing. Even though there is a long list of other pollutants, many presenting problems as serious or greater than the products of coal handling and combustion, they usually are colorless gases or fine mists and consequently cannot be seen or felt. In contrast, coal smoke and fly ash can be seen and felt and this leads the public, where excessive quantities are produced, to conclude that coal is a dirty, messy fuel. Coal therefore is particularly vulnerable to community attack. An aggressive public relations program, backed by constructive control effort, is the best insurance against the finger of unjust accusation where other sources are responsible.

Protect and expand existing markets. By offering engineering aid on air pollution problems as part of a total merchandising service, conversions to oil and gas where such problems are critical can be forestalled. If problems are due to antiquated burning equipment, the groundwork can be laid for the sale of modern coal-burning units.

Avoid punitive legislation. If the industry fails to recognize its responsibility for the solution of air-pollution problems, it runs the risk of passage of impractical laws. In other words, the high cost of compliance with an ill-conceived law can jeopardize a company's position and thus also the economic benefits the community derives from that company's operation. Better solutions are achieved when industry, government and civic officials get together to develop a workable compromise.

Develop by-product markets. The collection and disposal of fly ash from electric power plants, formerly a nuisance and expense, is now a credit item. Important tonnage markets are being developed for the material in the making of concrete for dams, bridges, buildings and highways. As an example, the Wisconsin Electric Power Co. has announced plans for supplying about 50,000 tons of fly ash per year to the first unit of the Marquette Cement Co.'s new plant at Milwaukee, Wis., or about 15 to 16%

of the raw-material feed. Under study also is the possibility of developing an economical method for removal of sulphur dioxide from stack gases. Such by-products may not always return a net profit but their sale may at least offset part or all of the expense of air-pollution control equipment and labor.

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Now, federal, state and municipal authorities are warming up for a more effective attack on air pollution. On the municipal front, the number of air pollution control bureaus is steadily increasing; budgets are rising, in some cases, sharply; and a drive is on not only to tighten up existing smoke ordinances but also to extend controls so that they more adequately cover gases, fumes, mists, odors and other pollutants which have become more offensive during the last 10 yr.

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CITIES TIGHTEN CONTROLS

Air pollution control is primarily the job of municipal and state authorities. Fifty-two cities across the United States and Canada had air pollution control bureaus (with annual budgets over $5,000) in 1952, according to a tabulation made by the Air Pollution Control Association. Since that time, the number of cities with control programs has grown to well over 100. Budgets now range up to $2.6 million.

Nearly all city bureaus have adopted, or in some way used, "Example Sections for a Smoke Regulation Ordinance," framed in 1949 by the American Society of Mechanical Engineers. This provides standards for organizing and enforcing a smoke regulation program. The one notable exception to acceptance of the ASME model ordinance is Los Angeles where a highly restrictive and specialized ordinance has been promulgated to meet extraordinary smog conditions.

ASME's ordinance—in response to a need expressed by many of the Nation's cities—is now under revision. When completed, possibly within a year, the new version probably will:

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The pending revision of ASME's model ordinance is one indication of the tide sweeping the nation's cities for more stringent regulations and more comprehensive control programs. Higher budgets are another indication. Los Angeles might be considered the extreme case. Here, the budget nearly doubled, from $1,467,462 in 1954-55 to $2,598,755 in 1955-56. Perhaps more typical is New York City's proposed 1956-57 budget of $817,960, up 56%, or $294,969, over the previous year. In support of the proposed increase, air pollution control commissioner Leonard Greenburg pointed out that the national cost of smog, in losses suffered by business and agriculture, in damage to property and outlays for control efforts, is about $1.5 billion annually. The annual cost to New York City is about $100 million. Dr. Greenburg added:

"The lack of recognition of the importance of this problem and the appropriation of insufficient funds may well mean that 10 yr from now New York will find itself in the position in which the city of London found itself when more than 4,000 deaths were brought about by air pollution, and as the city of Los Angeles finds itself at this very moment, harassed by smog which interferes with its natural development as a great area of the United States."

STATES MORE ACTIVE

Control of air pollution by states, though less advanced than its municipal counterpart, is fast moving into the picture. For example:

Michigan's Governor Williams, in his address to the legislature this year, recommended that the State Health Department be granted "the necessary authority and manpower to deal more effectively with the problem of air pollution." He added that "the expansion of industry and the use of new techniques and fuels is creating a problem of air pollution." A bill was subsequently introduced in the Michi-

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CITIES across the Nation, with increasing state and federal support, plan a firmer crackdown on air pollution. Keeping ahead of the crackdown will protect . . .

Coal's Stake In Reducing Smog

By expanding air cleanup programs now, coal will avoid the headaches of punitive legislation; gain public relations and sales benefits. Needed most: intensified effort by individual companies.

By W. A. RALEIGH, JR.
Assistant Editor, COAL AGE

A GROWING MOVEMENT against air contaminants that create a nuisance, damage property and impair health makes it vital for coal to expand and enlarge its participation in air cleanup programs. Intensified effort to solve the problems arising out of the production and utilization of coal offers the industry opportunities to:

Maintain and improve community standing. Even though there is a long list of other pollutants, many presenting problems as serious or greater than the products of coal handling and combustion, they usually are colorless gases or fine mists and consequently cannot be seen or felt. In contrast, coal smoke and fly ash can be seen and felt and this leads the public, where excessive quantities are produced, to conclude that coal is a dirty, messy fuel. Coal therefore is particularly vulnerable to community attack. An aggressive public relations program, backed by constructive control effort, is the best insurance against the finger of unjust accusation where other sources are responsible.

Protect and expand existing markets. By offering engineering aid on air pollution problems as part of a total merchandising service, conversions to oil and gas where such problems are critical can be forestalled. If problems are due to antiquated burning equipment, the groundwork can be laid for the sale of modern coal-burning units.

Avoid punitive legislation. If the industry fails to recognize its responsibility for the solution of air-pollution problems, it runs the risk of passage of impractical laws. In other words, the high cost of compliance with an ill-conceived law can jeopardize a company's position and thus also the economic benefits the community derives from that company's operation. Better solutions are achieved when industry, government and civic officials get together to develop a workable compromise.

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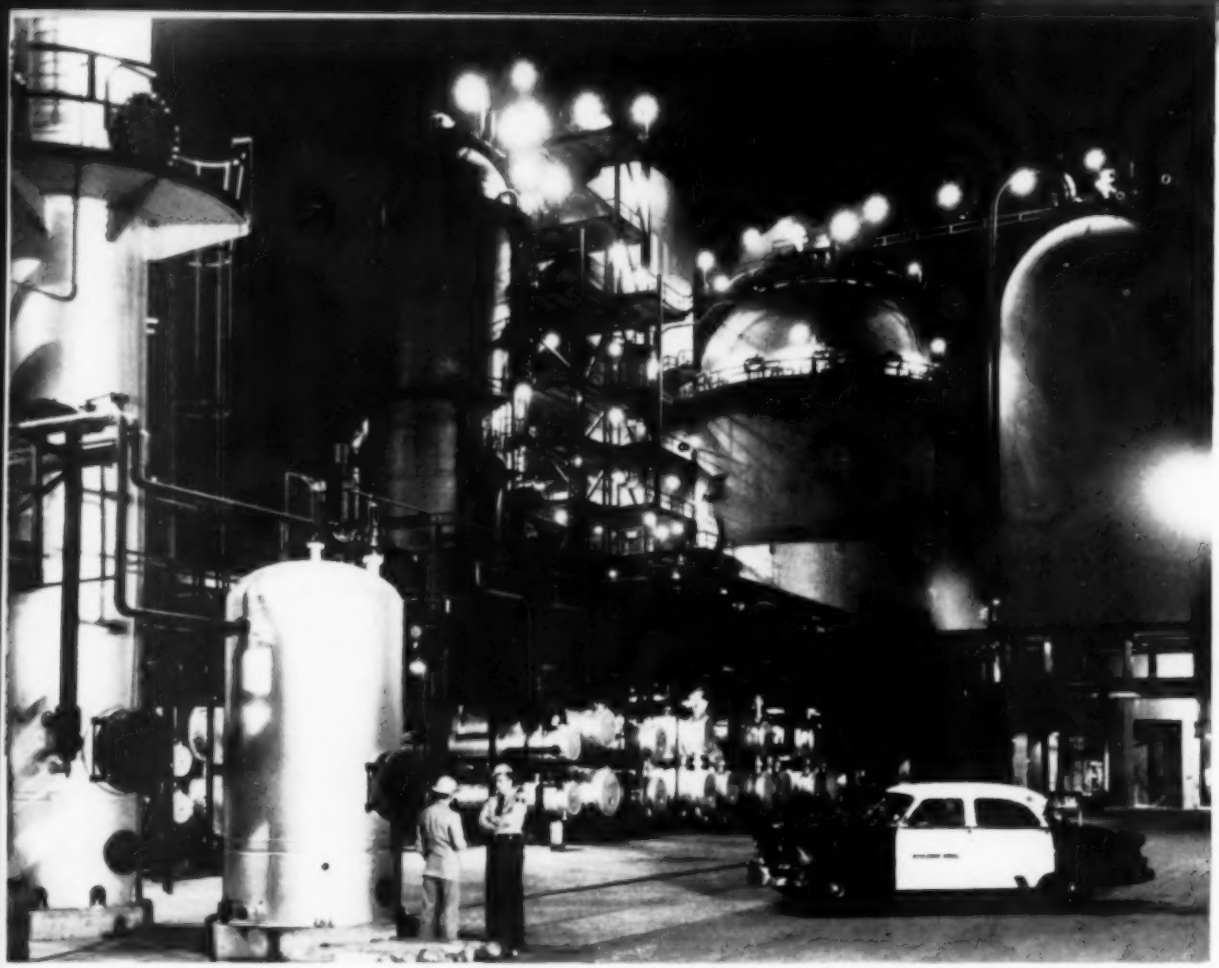

REGULATIONS on pollution-causing equipment are strictly enforced in Los Angeles. Here, as often in other cities, coal is not the principal offender—major pollution sources include oil refineries, autos and home incinerators.

gan legislature to set up an air-pollution control commission as a division of the State Health Department.

Two bills introduced during the last session of the New York state legislature proposed alternate plans for organizing a state board to establish and enforce standards against air pollution. One of the bills would define a precise set of specifications for the purity of the air. Violations could be prosecuted as criminal offenses subject to fines up to $500 for a violation and $100 a day for continuing violation. The other bill would empower a proposed state air pollution board generally to combat air pollution by setting up a performance type of code. Enforcement of the code would depend on overall conditions rather than established standards and violators would be subject only to civil prosecution. Indications are that the two bills were introduced primarily for study and hearing purposes and would not be pushed for passage this year.

In the state of Washington, Seattle's City Air Pollution Control Board has recommended that the State Pollution Control Board be given the same powers over impure air that it now exercises in water pollution. The state board now has powers to define and investigate water pollution, and to develop and enforce "minimum standards" of purity.

Because of the geographical scope of air pollution sources, interstate controls are also being pushed. For example, the Interstate Sanitation Commission of New York, New Jersey and Connecticut got an OK from Congress July 23 to go ahead with air-pollution studies. Formerly concerned only with water pollution problems, the commission will spend $60,000 to find out whether air pollution is an interstate problem in the New York metropolitan area, and, if so, what should be done about it.

U. S. MOVES IN

The Federal government, although not yet involved in enforcement, is stepping up its program of research and technical assistance. The battle to clean up smoggy air, off to a modest start this year, will be gaining momentum in the months ahead, McGraw-Hill's Washington Bureau reports. The effort to combat air pollution still goes into sizing up the problem—just one of the necessary preliminaries to mounting an effective attack.

Congress last July enacted the Air Pollution Research and Technical Assistance Act (Public Law 159), throwing the resources of the U. S. Public Health Service into the field. The act authorizes $5 million a year for 5 yr in grants and contracts. Through this act, USPHS will:

1. Spend money to learn which pollutants harm living things and how the harm is done.

2. Work with industry, state and local government officials to help them plan more effective control measures. Unlike the federal stream pollution law, which went on the books 7 yr earlier, the air pollution act gives USPHS no responsibility or power to act against polluters. It leaves enforcement entirely to state and local agencies armed with their own laws and ordinances.

So far, with its program barely off the ground, USPHS has spent only $1,722,000, its full fiscal year 1956

appropriation. Moving into its second year, the agency has asked for $3 million—still under its authorized limit—for fiscal year 1957. It's now certain to get all or nearly all that amount. Here's what USPHS has done to fulfill its mission and some of the things it hopes to do in the coming year:

In research—by far the biggest part of the program—USPHS directs operations at the Robert Taft Sanitary Engineering Center in Cincinnati; gives grants to university and other private researchers, mainly to learn more of the chemistry and medical aspects of air pollutants; makes agreements with other federal agencies; and negotiates contracts for research and development projects planned by USPHS but carried on outside.

In technical assistance, USPHS sends trained engineers into the field to help state and local abatement agencies, primarily with surveys. Comprehensive surveys with such help are now under way in Connecticut, where a map of the pollution situation in each city and hamlet of the state will be drawn, and in Louisville, Ky. Now being planned is a similar survey of Washington state.

USPHS training takes the form of short lecture courses at the Taft Engineering Center set up for businessmen, and state and local government officials. The courses cover such subjects as how to organize an air pollution survey, the legal and administrative problems involved in operating a pollution control program, how to sample dangerous pollutants, and others dealing with various applications of the physical and engineering services, meteorology and the like. Due to start soon is a program of training grants, traineeships and special demonstration projects giving more emphasis than heretofore on medical aspects of air pollution.

Pollution Control—How, What and Where

Typical Controls	Principle	Pollutants Controlled: Aerosols	Pollutants Controlled: Gases	Where Used
Baghouse	Cloth-bag filter	Dust Fume Smoke	.....	Smelter and mills Foundries Ceramic Aggregate and cement Feed and flour Food processing Chemical plants
Cyclone	Centrifugal air separator	Dust	.....	Nearly all industries
Electrical precipitator	Electrostatic precipitation	Dust Fume Smoke	.....	Smelters and mills Calcining Oil refineries Foundries Chemical plants
Fume burner	Afterburning	Oil Mist	Malodors Aldehydes Ammonia Solvent Hydrogen sulfide	Food processing Oil refineries Fish and meat Paints and varnish Soap and detergents Foundries Animal and vegetable oils Fertilizer Paper and plastics
Water scrubber	Wetting and impinging	Dust Mist	Odor Organic acids Ammonia	Soap and detergents Paints and varnish Fertilizer Aggregate and cement Calcining Fish and meat Food processing Oil refineries Chemical plants
Improved fuel, equipment or operation	Complete combustion	Smoke	Sulfur dioxide Oxides of nitrogen	All industrial or commercial combustion processes
Catalytic combustion	Afterburning Complete combustion	Smoke	Organic acids Aldehydes Oxides of nitrogen Carbon monoxide Hydrocarbons	Automobiles
Gas shutoff (–now being developed)	No burning during deceleration			
Rubbish burial	No burning	Smoke Fly ash	Organic acids Aldehydes Nitrogen dioxide Carbon monoxide	Industrial, commercial and domestic disposal and incineration
Multiple chamber incineration	Complete combustion			
Sulfur recovery	Chemical conversion	Smoke Fumes	Sulfur dioxide Hydrogen sulfide	Oil refineries, petrochemical plants
Vapor recovery systems	Conversion	Mist	Hydrocarbons	Production, refining and marketing of petroleum products Petrochemical plants
Floating roof	Confinement	Mist	Hydrocarbons	

WHAT COAL DOES NOW

The coal industry has not been unaware of its responsibility in air pollution control. In fact, "the coal industry was the first industry to tackle the problem; and the first to recognize its obligation to the communities and industries that use or purchase solid fuel," according to H. B. Lammers, chief engineer, Appalachian Coals, Inc., and former chairman, the Coal Producers' Committee for Smoke Abatement. "In the interest of smoke abatement and better coal utilization, the committee was organized in 1941 by a number of local operating associations and coal originating railroads.

"Through its engineering staff, CPCSA has offered advice and consultation service to municipal officials, chambers of commerce and other interested parties. Assistance has likewise been provided to architects, engineers and consultants on the design, installation, maintenance and operation of fuel-burning equipment.

"CPCSA fuel engineers have conducted surveys in over 200 cities in the U. S. and Canada to determine the cause and source of air pollution. Thousands of plants have been inspected and provided with specific recommendations for eliminating and reducing pollution to a satisfactory level. Such inspections were made in homes, schools, municipal buildings, and in commercial and industrial plants of all sizes and descriptions. Included in the surveys were the

How CPCSA Conducts an Air Pollution Survey

WHILE ITS ACTIVITIES ARE VARIED, the Coal Producers Committee for Smoke Abatement has always based its work on the engineering survey and analysis of individual plant problems to reduce excess smoke or flue dust emission, and on improved operating economy.

A survey is arranged and conducted somewhat as follows:

1. A request for a survey is made by a local organization, such as a municipal body, chamber of commerce, or manufacturers association interested in reducing air pollution in its area, or improving the performance of its membership's fuel burning plants. The committee tries to limit surveys to the marketing area or territory served by one or more of the affiliated associations or railroads and, those localities sincerely interested in reducing air pollution.

2. After a date has been set for the survey, the local body sponsoring the survey supplies the list of plants to be visited with the names of the persons or officials to be contacted for admission into the plants. No effort is made to obtain any information regarding the plant before the actual visit.

3. The survey engineer making the inspection attempts to determine the specific reasons for poor performance and/or excess dense smoke or flue dust emission. He examines the equipment (for proper sizing and installation), the controls provided, the operating procedures employed and checks for any other factors contributing to excess dense smoke or flue dust emission.

4. Correct operating procedures are demonstrated, if necessary, and other corrections required are discussed with designated plant personnel before leaving the plant.

5. A written report is prepared for submission to each plant inspected and this contains a brief description of the equipment, list of the findings, and specific recommendations for correction of any faults found.

6. A complete report is also prepared for submission to the organization sponsoring the survey. This report offers specific suggestions for accomplishing the desired results. These are based on the data collected in the individual plants, the location of offending plants (surveyed and otherwise) in the community, usual meteorological conditions of the neighborhood, the surrounding terrain and other pertinent data collected or observed.

The number of plants included in a survey has varied from 15 or 20 to over 300. The size of plants has ranged from those burning 25 tons of coal per year to those burning several hundred thousand tons.

Solution of a problem in the individual plant be it one of excess dense smoke, flue dust emission, poor operating performance or excessive labor requirements, is sought along the following lines:

1. Modification of operating procedures or improved maintenance.

2. Application of more adequate controls or other auxiliary equipment.

3. Installation of new equipment.

Two or more alternative methods for solution of the problem may be offered. Every effort is made to render solutions that will (a) reduce smoke or flue dust emission to or below acceptable levels; and (b) be economically justifiable.

A solution, for example, proposing the application of a special coal that is not readily available on the local market at a reasonable price is not ordinarily considered a proper solution. A solution that requires a large expenditure for auxiliary equipment of one kind or another for a plant with a low fuel consumption would be unsatisfactory.

Attention of the equipment manufacturer is called to those cases where equipment is poorly or improperly installed and, in some cases, assistance or advice is requested of the equipment manufacturer in the solution of the problem.

CPCSA services are available to city officials, civic bodies and individual plant owners wanting to reduce excess dense smoke or flue dust emission—without charge. The committee's work is directed by a group representative of the sponsoring membership and executed by a small permanent staff assisted by fuel engineers of the affiliated producing companies and railroads.

effects of weather and topography on the local problem. Analysis of problems in cities was made on foot, by car, from observation towers, and from planes and helicopters."

Citing accomplishments, A. L. Kiewit, CPCSA's director of engineering, says the committee has been of material assistance in:

1. Setting up and administering air pollution control programs that have or are accomplishing the results desired without penalizing the burning of bituminous coals.

2. Preventing, in some cases, the adoption of ordinances that would have the effect of practically outlawing the use of coal.

3. Correcting the idea that coal smoke was the only and chief cause of the air pollution problem in metropolitan areas.

4. Assuring better coal-burning installations through pushing the modification of building codes, or the inclusion of provisions therein, so that coal-fired equipment can be satisfactorily installed if desired.

5. Helping individual plant owners to improve their plant's performance and their relationship with neighbors.

6. Reducing smoke pollution from vessels operating in the Great Lakes area, as part of a program originally organized by the Lake Carriers' Association and Bituminous Coal Research, Inc.

Also worthy of special note: Bituminous Coal Research has contributed concretely to coal's air cleanup effort through, among other things, the development of better stoker equipment and improved furnace and boiler design. The research group has played a prominent role in combustion conferences aimed at showing regional groups how to obtain better operating results with coal in commercial and small industrial plants. As noted above, BCR has also participated in the joint Great Lakes Air Pollution Abatement Program which is said to be protecting a coal market of 1½ million tons per year.

WHAT COAL CAN DO

CPCSA and BCR activities, however commendable, must be expanded and enlarged upon to:

1. Anticipate the all-out, more comprehensive attack on cleaning up the air indicated by legislative trends and developments.

2. Guard against the dangers of misuse of coal—always more likely to occur in a period of rapid expansion in

Stream Pollution: Washington Roundup

PRESIDENT EISENHOWER signed into law July 9 a bill which removes the last vestige of doubt that the government is in the battle to clean up the Nation's waterways for good. Nearly 2 yr of debate and some sharp infighting ended with enactment of a new and "permanent" federal water pollution control law, replacing the once-extended 1948 act expiring June 30.

The new act is less a departure from its predecessor than a beefed-up and improved version of it. As before, the emphasis still is on research, planning and training assistance by the U. S. Public Health Service to benefit state and interstate pollution agencies. To the latter, however, remains the job of carrying out abatement measures where pollution exists within their borders.

The big change here is one of degree, and it's an indication that Congress—and the administration which fought hard for a new law—mean business in their drive to get cleaner streams. The new act gives USPHS a broader, more free-wheeling role as promoter of pollution abatement activity. There will be more money flowing from USPHS to state and interstate agencies to expand and improve their clean water programs. USPHS and state officials feel that this, plus the conversion of the federal program to a permanent basis, will give a big lift to their efforts and objectives.

USPHS also has a new mandate to step up its work in planning a comprehensive program, regional and national, to abate pollution. Under the law, it has authority to gear individual state and interstate agency programs into their master plans. The new act authorizes the U. S. Surgeon General, administrator of the program, to condition federal grants on the willingness of state and interstate bodies to mesh their programs into the larger scheme.

To buttress the broadened attack, Congress came through with new and stronger enforcement provisions permitting the federal government to file suits requiring cleanup measures. But, the act is studded with procedural and other safeguards to protect polluters against hasty federal court action.

The stronger enforcement authority is balanced also by specific provisions holding rigidly to the concept that primary responsibility for abating pollution rests with the polluters themselves and the state or interstate agencies involved. Federal actions to compel abatement remains strictly a last resort weapon, to be used only when state agencies fail to act. This is somewhat short of what the administration wanted, but even they concede that the latent threat of a court order should be enough in most cases to get action.

Under the old law, if polluted water flows across state lines, the federal government could take a polluter to court only if it had the permission of both states involved—the one in which the pollution occurs and the one affected by it—the latter a downstream state receiving the discharged effluents.

The government asked Congress to be allowed to take a polluter to court without each permission. Congress, however, has gone along to the extent of allowing federal officials to proceed if they obtain consent of just one state—the state affected by the pollution.

For industry, there's still an added safeguard. Federal courts are directed under the law to tailor pollution abatement measures sought by federal officials to the polluter's ability to pay for getting the job done. This was in the 1948 law, but since no enforcement action was ever sought under that act, it remains untested. The section was, for a time, deleted from the new law while it was debated by Congress but was restored in the final version.

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coal use such as now in progress.

3. Keep ahead of public opinion, which has a fancy for singling out coal users as primary sources of air pollution.

Perhaps what is needed most is an intensification of effort by individual coal companies. Here are suggested lines of action:

IN UTILIZATION . . .

1. Find out where air pollution problems exist among your customers. This might be done through salesmen's call reports, questionnaire surveys, meetings with air-pollution agencies, or some combination of these methods.

2. Analyze the problems and study remedial measures, preferably in consultation with air-pollution specialists. Remedial measures might take the form of modern coal-burning equipment, special combustion installations, such as the overfire jet, or specific air pollution control devices, such as the BCR stack spray.

3. Train salesmen and fuel engineers in the fundamentals of air pollution so they can talk intelligently on the subject. Have them offer engineering aid on air pollution control problems as part of a complete merchandising service.

4. Support and expand research on modern coal-burning equipment and on air pollution control devices. Improved residential stokers are paving the way toward minimizing smoke production by home furnaces. BCR's automatic coal-fired package boiler—now under development—should help considerably in controlling air pollution from commercial buildings and small industrial plants.

5. Prevent the emission of objectionable volumes of airborne dust at the point of consumption through dustproofing coal (*Coal Age Mining Guidebook*, Mid-July, 1956, p 111).

AT THE MINE . . .

1. Equip every air cleaning plant with an adequate and efficient dust-collecting system (*Coal Age Mining Guidebook*, Mid-July, 1956, p 105). Such a system not only prevents the emission of large volumes of dust into the air but also contributes to better operation.

2. Suppress dust in heat driers, particularly those handling the smaller fines (*Coal Age Mining Guidebook*, Mid-July, 1956, p 110).

3. Eliminate gob and refuse fires. The basic defense is keeping the combustible content of the coal as low as possible, though it is not always practical to keep it below the burning level.

Proper piling, compacting and covering in accordance with methods recently developed through research and mine experience will prevent ignition.

Existing fires can be extinguished by one or a combination of several measures. As an example, one very stubborn fire of years' standing was finally put out by long-continued soaking and cooling by sprinkler lines.

WASHING AND DRYING blended coals are done in modern aluminum-covered preparation plant between raw and clean coal stockpiles. Wash and dry section is heated by system that permits hot air to rush through open steel flooring from vented conduit in foundation.

DESTINATION of clean coal from Gibraltar's preparation plant is 5,000-ton stockpile feeding barge-loading conveyor system.

A 2,000,000 ton per yr mine goes "on stream" to provide energy for AEC facilities in Ohio Valley

Here's the full account of stripping, pit-power supply, storage and barge loading at Gibraltar

By A. E. FLOWERS
Associate Editor, COAL AGE

The Gibraltar Story

I. Development Factors

SUPPLYING MORE THAN 2 MILLION TONS of coal per year to generators delivering power for the Portsmouth atomic production center is the task of the Gibraltar Coal Co.'s new strip mine.

Highlights of this giant mine-to-river operation are two-seam mining, raw- and clean-coal storage, and up-to-date preparation and unique barge-loading facilities.

Located near Central City on the Green River in western Kentucky, the mine is the latest in a program aimed at building new operations near water transportation. Key factors contributing to the opening of the new mine are:

1 Navigation improvement work by the U. S. Corps of Engineers, making river transportation possible.

2 Sufficient coal reserves to provide large tonnages over a long period of years.

3 Demand for huge quantities of coal to feed the boilers generating steam for the Ohio Valley Electric Corp. (OVEC) generators.

Ayrshire has been aggressive in acquiring as much land as possible close

RAW-COAL FACILITIES include 100-ton truck hopper, rotary breaker, two 5,000-ton stockpiles and belt conveyors. Fleet of 51-ton dropbottom tractor-trailer coal haulers feed the breaker section of the preparation plant.

to river transportation. The limited area of coal land along the Mississippi and Ohio Rivers and the potential industrial growth prompted Ayrshire's search for coal in those areas. Efforts were concentrated on blocking out property within 20 mi of water transportation. The first major step toward achieving this goal was taken when the company assembled large reserves in Perry County, Illinois, along the Mississippi River. In 1940, the company acquired a large area in Warrick County, Indiana. In 1947 Ayrshire added property in Muhlenberg County, Kentucky, along the Green River. If a property was back from a river, a right of way to the water was secured.

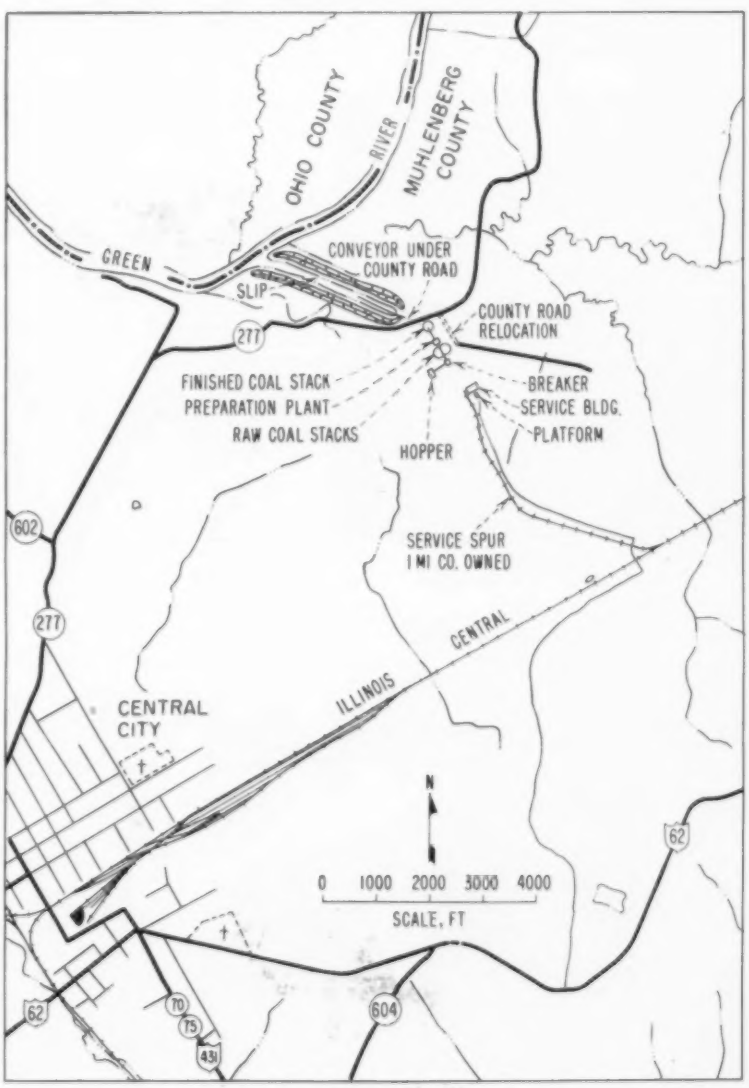
While the properties were being tied together a large-scale program of drilling and mapping was carried out to determine coal quality and establish the consistency of the seams. The aim was to have the necessary information about each of the coal fields ready so that they could be developed as opportunity presented itself.

Having potential strip properties in these areas, Ayrshire made it known to various power companies that the company had large reserves available on water. The company held the lands and from time to time gave reports to the power companies. This paid off in 1952 when the U. S. Atomic Energy Commission decided to build another uranium diffusion center to produce U-235.

The new center would need huge quantities of electric energy. Nowhere was this block of power available. New generating capacity would have to be built no matter where the plant might be located.

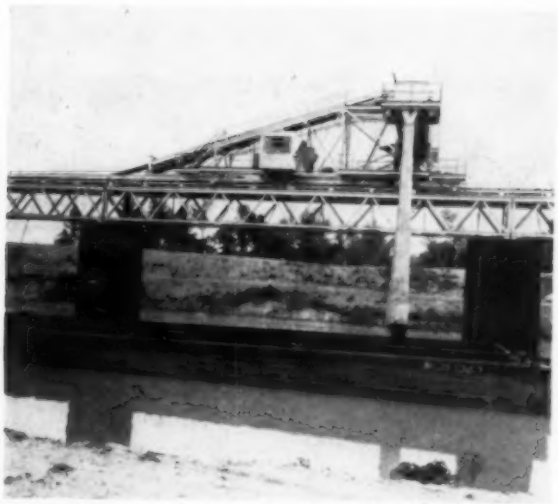
SELECTING THE ATOMIC SITE

After careful study of various poten-



GIBRALTAR FACILITIES are 2 mi northeast of Central City on Green River.

BARGE SLIP, 2,750 ft long and 160 ft wide, was dug with dragline. Waterway can handle 16 barges, eight on a side.



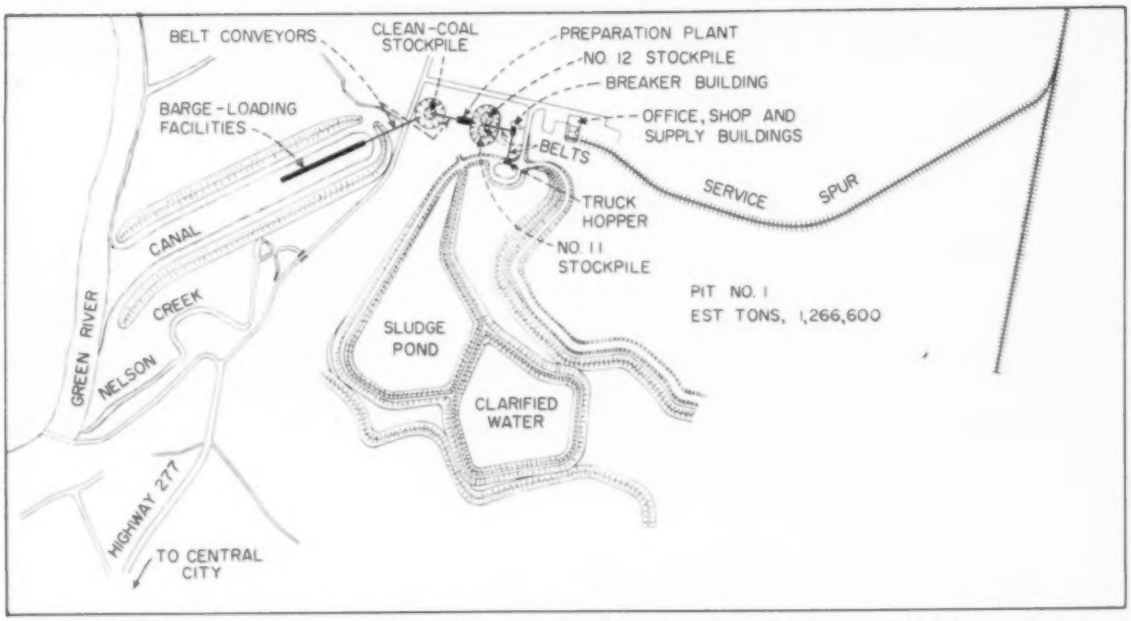
TELESCOPIC chute (aluminum) loads barges. Sections raise, lower automatically as coal level changes.

LOWERING CHUTES keep degradation and segregation to a minimum.

NEW LOCK on Green River at Calhoun handles 1,500-ton barges. Locking time averages 20 min for tow of four 35x195-ft barges.

LOADED TOW eases into lock on downstream journey. Tows travel 100 mi per day on narrow, winding river.

VIEW FROM RIVER shows shuttle belt with loading chutes straddling tripper belt supported by cells in barge slip.



PREPARATION and service area includes barge slip, stockpiles, preparation plant and sludge ponds.

tial locations, the AEC leaned toward a site somewhere in the Ohio River Valley. In searching for an adequate and dependable supply of power necessary for the atomic operation, the AEC first turned to the private electric utilities of the valley.

They learned that the project would need more power than was consumed in 1952 in both Indiana and Kentucky or almost two-thirds of that consumed in the highly industrialized state of Ohio. AEC said that the power had to be available in a hurry. It had to be dependable far beyond any normal needs. And it had to be low in cost. The utilities were asked if they would be able to supply the AEC power requirements and under the conditions outlined if the plant was built in the Ohio Valley. The private power companies said they could do the job.

As the first step, the AEC chose three potential general areas in the Ohio Valley for its atomic plant site. The private electric companies then made detailed engineering studies of the economics involved in generating power and transmitting it to any one of the three general areas.

On May 12, 1952, the 15 power companies made a proposal to AEC to form a new corporation to be jointly owned by the individual companies. In July, Congress gave AEC part of the authority and funds needed. The following month, the commission announced the site for the plant. With their prospective load center pinpointed, the utilities were able to take further steps toward their agreement with AEC. On Oct. 1, the Ohio Valley Electric Corp. (OVEC) was organized under the laws of Ohio by the 15 companies. The same day, in Indiana, OVEC's wholly owned subsidiary, Indiana - Kentucky Electric Corp., (IKEC) was formally organized.

Two weeks later OVEC and AEC executed a 25-yr power agreement—the largest single contract ever entered into by a single customer in the history of the electric utility industry.

The agreement called for the build-

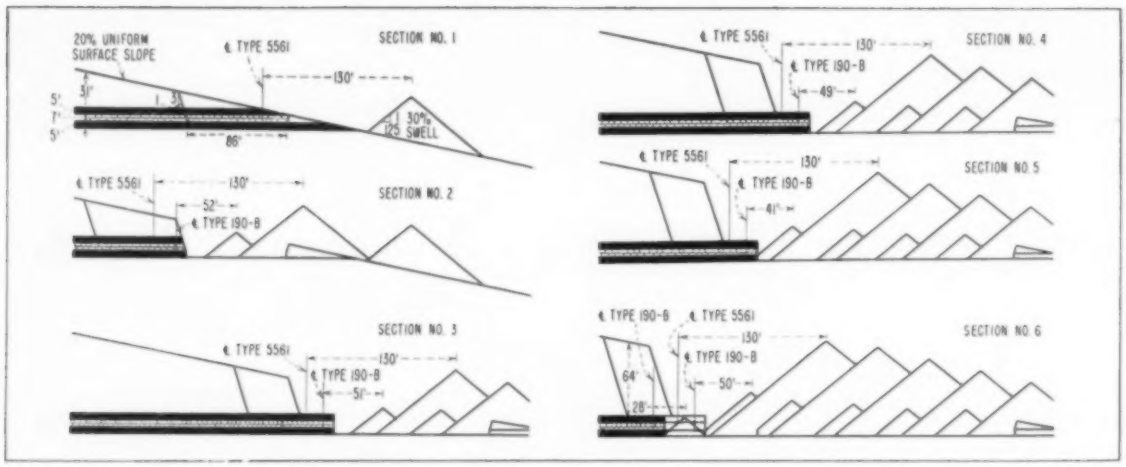
Facts About the Gibraltar Mine

Overburden limits over No. 12 Seam	0 to 60 ft
Average overburden over No. 12 Seam	40 ft
Average interval between No. 11 & No. 12 Coal	4 ft
Total average overburden	44 ft
Recoverable No. 11 coal thickness (80% 4 ft 6 in)	3 ft 7 in
Recoverable No. 12 coal thickness (70% 4 ft 11 in)	3 ft 5 in
Total recoverable coal	6 ft 9 in
Recoverable ratio	6.0
Days stripping per year (11 mo or 48 wk; 1 mo allowed for vacations, etc.)	336
Cu yd overburden per year, 5561 shovel (35×42×24×336)	11,854,080
Cu yd overburden per year, 190B shovel (35×6×24×336 = 1,693,440. However, since ratio of interval to No. 11 coal is 1.1, the interval machine can only strip 1,100,000 cu yd per year, or about 2/3 of maximum time)	1,100,000
Total cu yd overburden per year	12,954,080
Cu yd per month (11 mo)	1,177,644
Average cu yd per month (12-mo basis)	1,079,507
Tons of coal per year	2,159,013
Tons of coal per month (11 mo)	196,274
Tons of washed coal per day (5 days/wk; 48 wks; 240 days/yr.)	9,000
Tons of washed coal per hour (7¼-hrs/shift; 2 shifts/day)	621
Tons of washed coal per hour required for OVEC contract (3,480 hr) (2,047,000 tons per year)	588
Use for plant, tph(900 tons per hour raw×75%)	675

Note: A Marion 7400 dragline with 13-cu yd bucket builds roads, opens box cuts and is available for stripping coal if needed.

Ayrshire's experience with nine stripping shovels over a period of 2 yr shows an average of 32.5 cu yd moved per hour per cubic yard of bucket capacity. The new 5561 shovel at Wright mine since start of operations has moved in excess of 40 cu yd per hour per cubic yard of bucket capacity. Therefore, since two similar type machines are contemplated at Gibraltar, the capacity has been conservatively figured by using 35 cu yd per hour per cubic yard of bucket capacity.

In addition, a 13 cu yd dragline is being used for construction work at the property and will be used for developing roads, opening box cuts, etc., and will be available for stripping coal if required.



TYPICAL CROSS SECTIONS show how spoil is handled as successive cuts are taken.

ing of two steam-electric generating stations that would be among the world's largest and the transmission facilities to connect them with the atomic center. Within 2 wk after execution of the agreement, OVEC announced its selection of sites for the two power plants: Madison, Ind., and Cheshire, Ohio. The Indiana plant was named Clifty Creek; the Ohio station, Kyger Creek. Combined capacity of the two plants is 2,200,000 kw.

The sites at Madison and Cheshire were chosen for several reasons: Proximity to coal, cost of transporting coal, cost of transmission facilities and relation of sites to existing systems of the 15 sponsoring companies and to the atomic plant.

CONTRACT FOR COAL

Five major coal companies, including Ayrshire, and Midco Mines, which formed the Gibraltar Coal Co., share the contract to supply approximately 7,400,000 tons of coal per year. All coal is transported by barge via the Ohio River and tributaries.

When the Ohio Valley Electric Corp. idea was born, the utility companies contacted Ayrshire to see if the company could supply coal from any of its properties. Since Ayrshire had acquired large reserves near river transportation where new large-tonnage mines could be opened, the company was in an excellent position to meet OVEC's needs. Ayrshire began negotiations with OVEC in 1951. In 1952 they came to an agreement. And in 1953 they entered into a formal contract.

The basis of the contract was that Ayrshire was to supply about 1,000,000 tons of coal per year from its property in Warrick County, Indiana, and a similar quantity from its property in Muhlenberg County, Kentucky. The contract period was 15 yr.

Ayrshire set up a wholly owned subsidiary to develop two mines to furnish coal for use in the Madison Plant of IKE. The first of these, Wright mine, was completed in October, 1954. Coal from Wright mine is hauled, prepared and placed in barges on the Ohio River through facilities furnished by the Yankeetown Dock Corp., owned jointly by Ayrshire and the Northern Illinois Coal Corp. now owned by the Peabody Coal Co., but operated by Ayrshire under a management contract. Yankeetown facilities also were completed in 1954. The facilities serve not only the Wright mine but also the Victoria mine of Northern Illinois, which also is geared to produce 1,000,000 tons per year.

Other large tracts of coal in Indiana and Kentucky available to OVEC were owned by Northern Illinois Coal Corp. and Midco Mines, Inc., now merged with Peabody Coal Co. These lands border the properties of Ayrshire and were available to OVEC as a source of large volumes of coal.

Northern Illinois also was asked to supply coal for the Clifty Creek plant. Co-operation between the two companies started shortly after each was awarded a similar contract to supply coal to the power plants. Each company had isolated tracts of coal land close to large acreages of the other. To consolidate properties and straighten boundaries, the companies exchanged various areas.

The next step in co-operation was to develop the Yankeetown Dock Corp. to provide rail and dock service to Ayrshire's Wright mine and Northern Illinois' Victoria mine. In discussing the proposed mines, officials of both companies agreed to undertake building a joint loading facility.

Success of the jointly owned dock facilities prompted Ayrshire and Midco to enter into a full-scale cooperative project on the Green River in Muhlenberg County, Kentucky. Conditions at the Kentucky properties were similar to those in Indiana. Both companies owned large reserves of coal in Muhlenberg County. And each had a contract with IKE to build a mine in that area. After a thorough study of the possible advantages of a single operation instead of two, particularly from the viewpoint of lower overall capital investment, Ayrshire and Midco organized the Gibraltar Coal Corp. in 1954. Each company owns 50% of the new corporation. Designed to produce and process over 2,000,000 tons per year. Gibraltar ships coal on both contracts. Gibraltar facilities are designed to handle 4,000,000 tons of coal per year and thus other undeveloped properties have access to low-cost water transportation to the growing industrial market along the Ohio River. The new cooperative venture is operated by Ayrshire under a management contract.

RIVER IMPROVEMENTS

An important and perhaps controlling factor in the decision to open the Gibraltar mine was the improvement work done along the Green River by the U. S. Corps of Engineers. As early as 1951, the Army engineers had plans underway to redevelop the river so that large, modern, 1,500-ton barges similar to those in service on the Ohio and Mississippi rivers could be used. The larger barges would be able to haul the large tonnages of coal that

Gibraltar Supervisors

Superintendent, ERVIN M. BAKER
Night superintendent, CLYDE DALLAS
Resident engineer, CHARLES WAGNER
Preparation foreman, JAMES VINEYARD,
Preparation foreman, second shift, RALPH ETTER
Store room clerks, VERNON McCONNELL and WILLARD VAUGHT
Electrician, WELSIE CURRY
Master mechanic, GARTH RICHARDSON
Pit foreman, OWEN KEMP
Second-shift pit foreman, ROBERT HICKMAN
Chemist, GEORGE MARTIN
Blasting foreman, R. C. NORMAN
Timekeeper: CARROLL CALLENDER

Ayrshire Officials:

President, J. W. MORGAN
Vice President, A. M. CAMPBELL
Vice President, Operations, R. K. BEACHAM
Vice President and Chief Engineer, R. H. SWALLOW
General Superintendent, W. A. ENDICOTT
Purchasing Agent, KATHRYN M. MYRICK
Preparation Manager, J. J. MERLE
Electrical Engineer, L. E. BRISCOE

would make a new mine profitable.

To make possible the use of the larger barges, the Army Engineer's study showed existing locks would have to be replaced. After a thorough study of the problem, the engineers came up with a plan that included building a new dam and lock at Calhoun and a new lock at Spottsville. Approval of the plan and appropriation of funds for the rehabilitation work was announced before the Gibraltar mine site was selected.

The new dam at Calhoun is made up of circular cell-type structures and is said to be the first of its type built. Interlocking steel piling was driven to bedrock in the river to form the outer surface of the cells. Alternate cells were put up and then filled with concrete. To complete the dam, the spaces between the cells were closed with segments of circular cells. The resulting shape of the face of the dam thus became a group of arcs.

The new locks are 82x600 ft and have hydraulically powered gates that speed locking time. An average tow, made up of four 35x195-ft, 1,500 ton barges can be put through a lock in 20 min. The old locks were 36x140-ft and only one small barge could be handled at a time. Gates on the locks also were manually operated and therefore locking time was much greater.

Gibraltar had an unusual problem in designing barge-loading facilities that would permit uninterrupted coal loading. The Green River is narrow and comparatively swift and other river-loadng mines are upstream from Gibraltar. Therefore Gibraltar did not want to use a conventional layout that would permit loading on the river.

Before selecting a method for the new mine, the company took into consideration the topography of the site, characteristics of the seam, and the desired loading rate. Responsibility for designing the facilities was given to R. H. Swallow, vice president and chief engineer. He and his staff came up with a proposal that included a canal capable of holding 16 barges with shuttle-belt loading from either side of a tripper belt conveyor extending out into the center of the canal. This layout was made to permit uninterrupted loading of barges in still water, away from river currents.

To assure coal for the complete tow of barges, the plan also included two 5,000-ton raw-coal stockpiles and a 5,000-ton clean-coal stockpile. These stockpiles not only permit coal to be loaded independently of the preparation plant or mine but also permit blending of the two coals before they are cleaned. One of the raw-coal stockpiles is made up of No. 11 coal and the other No. 12.

II. Two-Seam Stripping

Gibraltar produces coal from the west Kentucky Nos. 11 and 12 seams. Between the two coals there is a 4-ft layer of clay and limestone which must be drilled and blasted. The No. 11 seam averages 4½ ft and the No. 12 averages 4 ft 11 in. Overall stripping ratio is 6.0 to 1.

To handle the two-seam job, Gibraltar has available a total stripping capacity of 61 cu yd. The key machine is a 42-cu yd Marion 5561 electric shovel with a 135-ft boom, long dipper handle and high gantry that works around the clock. This unit is designed to strip the cover over the No. 12 coal, which will average 40 ft. A 6-cu yd Bucyrus-Erie 190B high-lift machine with a 70-ft boom removes the interval between the two seams. The third stripper is a 13-cu yd Marion 7400 dragline with a 175-ft boom.

The first unit to go into operation was the 13-cu yd dragline, which was used to excavate the slip for the barges, build a dike along the side of the property nearest the river, make slurry lakes for the preparation plant, and open the first pit while the 5561 was being erected. Dragline assignments now include developing box cuts prior to moving the stripping shovel to a new pit, building roads and stripping points or cutting through hills.

The 5561 first went to work uncovering the No. 11 coal which was below the outcrop of the No. 12 seam. This overburden was soft enough for the big stripper to handle without blasting. Now that the first cut has been taken the big shovel has moved up to its regular working position on top of the No. 12 coal. It uncovers a 45-ft strip of coal and can discharge spoil 130 ft away. A Caterpillar RD6 rubber-tired dozer works with the unit and removes the small material missed by the shovel.

PREPARING THE OVERBURDEN

Overburden covering the No. 12 coal now is drilled with a Bucyrus-Erie 50-R rotary dry-type unit, which went in service Aug. 15. Blastholes are 10 ⅝-in in diameter and are charged with Akremite and a primer of Austin 50% dynamite. Holes are laced with Austin detonating fuse and MS-delay connectors are used between holes. Gibraltar expects to break an average of 5 cu yd of overburden with each pound of explosive.

INTERVAL BLASTING

A special four-arm drill was designed and built by the company for drilling the material between the two coal seams. Mounted on a 42T drill chassis, the unit includes two Gardner-Denver air compressors identical with the 50-R overburden drill and four Cleveland D 14 jackhammers mounted on horizontal boom at the front of the machine.

A 3-man crew operates the machine and loads and detonates charges. In average rock, four 2-in-diameter holes are drilled in 4 min. Holes are drilled on 6-ft centers, charged with 1½x8-in Austin 50% gelatin and detonated with du Pont MS delays. The drill is operated three shifts. However, a second similar unit will be put into operation

MAJOR UNIT at 2,000,000-ton mine is 42-cu yd electric shovel that removes cover up to 60 ft over No. 12 coal.

REMOVING ROCK INTERVAL between the Nos. 11 and 12 coals is a job assigned to 6-yd shovel with 70-ft boom.

ROADBUILDING and opening new pits are jobs for 13-cu yd walking dragline. Unit is used for stripping too.

COAL LOADING is assigned to two electric shovels. Drop-bottom, 51-ton trucks have oil retarders for braking.

COMPANY-DESIGNED interval air drill sinks 2-in holes on 7-ft centers

soon and drilling will be done only on two shifts.

A 6-cu yd Bucyrus-Erie 190B high-lift shovel with an Amsco rock dipper works on top the No. 11 coal and piles the broken interval rock at the toe of the 5561 spoil.

LOADING AND HAULING

Gibraltar relies on a fleet of Euclid 24TDT 51-ton dropbottom tractor-trailer coal haulers to keep coal flowing to a 100-ton raw-coal hopper feeding the breaker section of the preparation plant. Four of the units are kept in constant service throughout the shift and two more are kept in readiness as spares. As the length of haul increases, additional trucks will be added as needed. After about 7 yr, either more trucks, a belt conveyor or a railroad spur will be needed to haul coal from outlying areas.

Trucks are powered by Cummins Type NVH 12-cylinder diesel engines with Fuller standard transmissions, and are equipped with Parkerburg oil retarders that automatically slow the trucks when they overspeed.

The oil retarder is a device for creating torsional resistance to control truck speed. Mounted on the drive shaft of a truck, the device is simple in design. The retarder system includes an oil tank, piping, heat exchanger, control valve and the retarder. The rotor on the retarder shaft revolves within the stator. Forward sloping radial vanes in the rotor are opposed by similar backward sloping radial vanes in the stator. Oil is delivered into the interior through holes in the stator walls. Maximum resistance occurs when the oil retarder is full. It can be operated partly full when less maximum resistance is needed. When no

resistance is needed it can be emptied completely. In other words, graduated braking can be achieved by partially opening or closing a valve on the dashboard.

A Marion 151M with a 10-cu yd dipper loads the No. 12 coal and a Bucyrus-Erie 190B with a 10-cu yd dipper loads the No. 11 coal. Coal is loaded two shifts.

III. Gibraltar's Power System

Power for Gibraltar is supplied by the Kentucky Utility Co. at 34,500 v and is metered at a common point for the whole operation. Three 1,000-kva Westinghouse transformers at the metering point step the voltage down to 4,160 for supplying the preparation plant, dock facilities and shop through four circuits made up of General Electric special mine power cables:

1. Three 200-kva transformers stepping the voltage down to 440 for the office, shop, garage and raw-coal breaker building. Power is carried to these various buildings by underground cable.

2. Two 4,000-v cables to two banks of 750-kva transformers reducing voltage to 440 for preparation-plant motors and controls.

3. An underground cable to the dock supplying 4,160-v power for the main belt conveyor for the loading station, and also serving three 100-kva transformers supplying 440 v for motors.

4. A combination of underground cable and overhead pole line to three 75 kva transformers supply 440 v to a pump delivering fresh water to the preparation plant.

For the pit supply, Gibraltar has its own overhead pole line from the metering station. Made up of three 2/0 conductors and a static wire, the line leads to two Westinghouse 1725-kva aircooled unit substations. These are connected in parallel in a loop system and it is the first time such a parallel hookup has been used as a stripping operation.

Gibraltar had several reasons for choosing two units rather than one larger unit. First, the 1725-kva stations are standard package units that can be served by 4/0 cable. They also are easier to move than a larger unit, and no special connections have to be provided for cables. To make the moving job easier, the substations were mounted on shop-made skids. A Caterpillar D8 tractor tows them to the new sites. The company also has designed and built a skid for the General Electric disconnects that are also moved with the transformer substations.

Sometime in the future Gibraltar expects the primary voltage to be stepped up to 66,000 v. In anticipation of this, the company has purchased equipment that is designed for the two voltages.

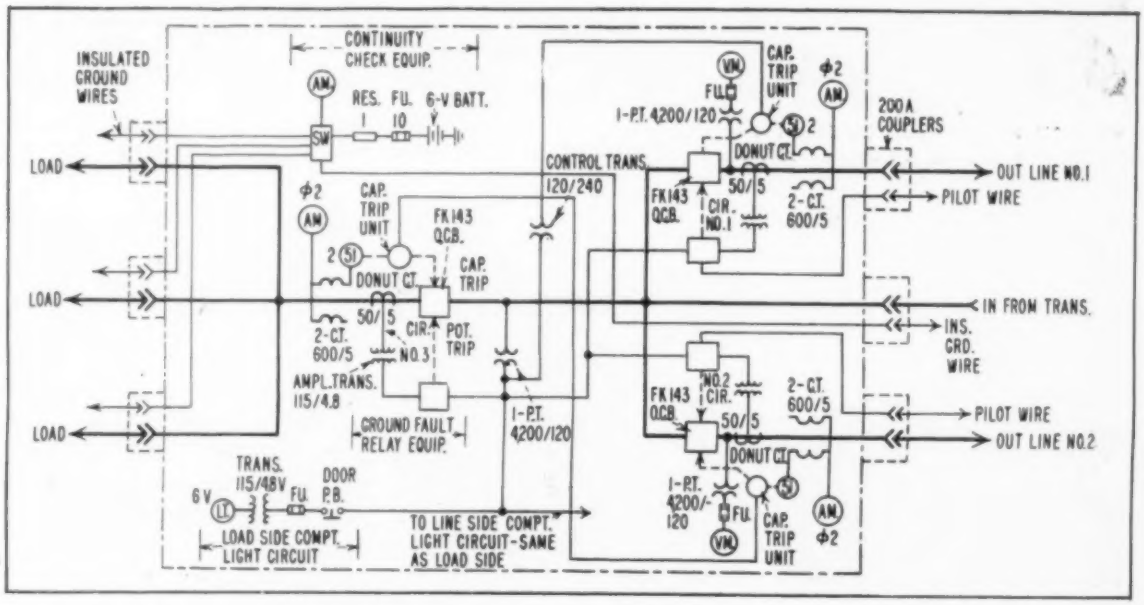
All components of the power-distribution system are ground-fault protected. Because of the parallel operation of the transformer stations, each grounding resistor is 96 ohms, and thus the current in the ground wire is limited to 50 amp.

Gibraltar also has a built-in continuity check for testing the condition of the ground circuit in cables leading from feeder distributors to equipment in the pit. Each of the circuit breakers is equipped with a pistol-grip handle whereby energy from a 6-v battery may be applied to the ground wires. The circuit is connected to the ammeter in the breaker and 5 to 10 amp flow through it when the ground wires are in normal condition.

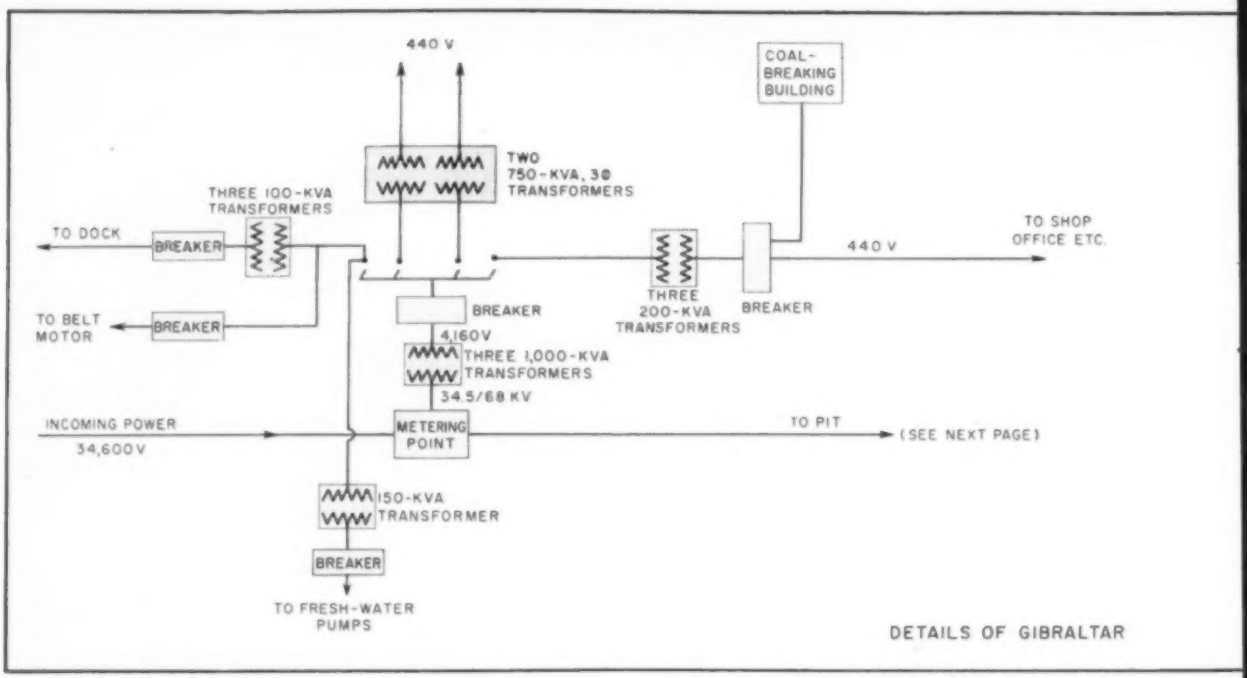
The company sacrifices the continuity test feature in the feeder distribution circuit located along the highwall so that there can be directional ground fault tripping in the substations. If a ground-fault should occur, the breakers are set so that the one nearest the fault trips first, then the next nearest, and so on back to the main substation.

One of the three ground wires in the power cable is insulated for 600 v. This insulated ground is used in the paralleling of the two substations to get directional ground-fault tripping.

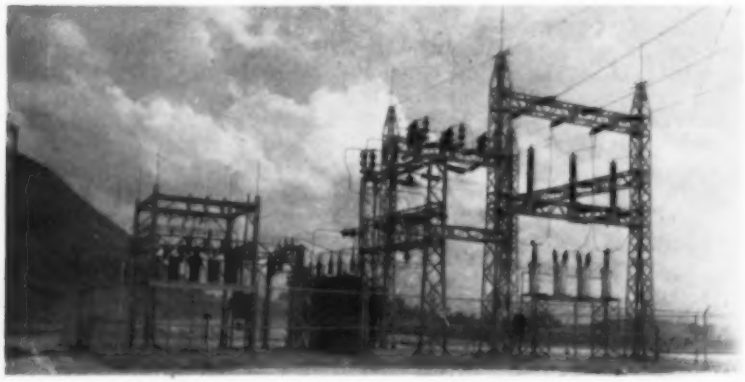
Connecting plugs on the cables, made by General Electric, are pro-



ONE-LINE DIAGRAM of triple-breaker skid includes ground-fault and continuity-check circuits.

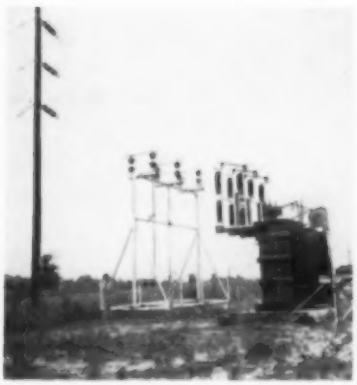


DETAILS OF GIBRALTAR



MAIN SUBSTATION includes three 1,000-kva transformers that reduce 34,500-v incoming power to 4,160 for mine service. Kentucky Utility Co. supplies power.

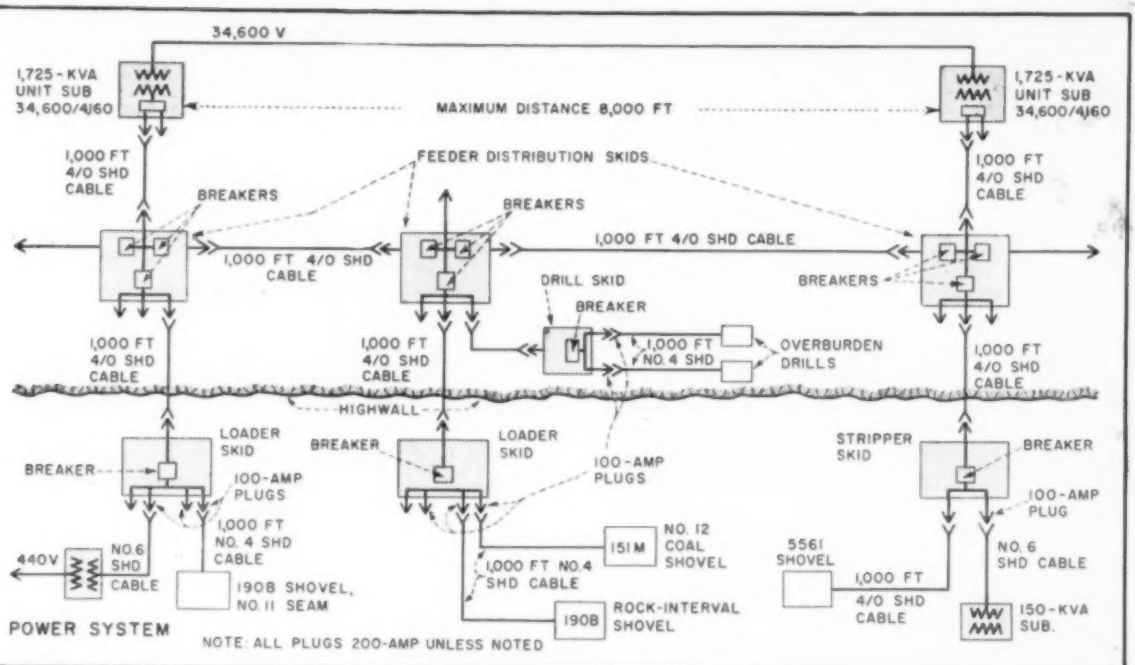
BREAKER at main transformer station protects 4,160-v side of circuit.



UNIT SUBSTATION is one of two parallel 1,725-kva units for pit power.

FEEDER DISTRIBUTION SKID has three incoming and outgoing plugs.

PIT SKID has one incoming plug, one breaker to provide power to shovels.



vided with five connections: three for power wires; one ground for the sheath and the two uninsulated ground wires; and one for the insulated ground wire.

Another protective feature is the fact that the breakers at the two unit transformer substations cannot be closed, paralleling them, if the phase rotation is wrong. Instrument panels on the substations show the voltage on either side of the breaker at all times. Thus if a breaker is open and power is coming from either or both stations it is shown. By looking at the meter, an electrician can determine if a cable plug has power on it before he disconnects it.

IV. Preparation, Transport

CLEANING THE COAL

The Gibraltar preparation plant operates two shifts per day, processing 900 tph of raw coal. Plant reject is 25%, leaving 675 tph of clean coal for loading.

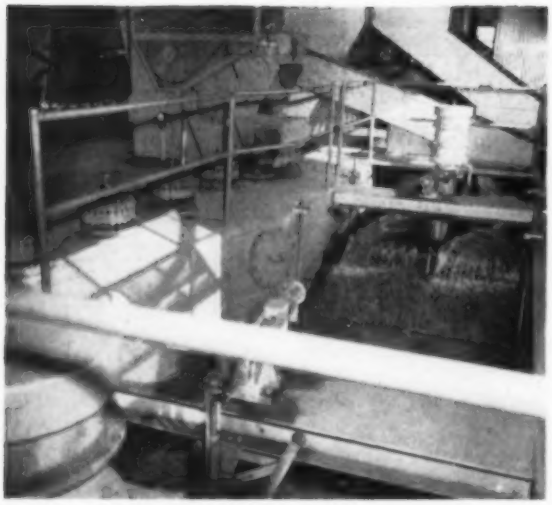
A 66-in reciprocating feeder driven by a 15-hp motor transfers coal from the 100-ton truck hopper to a 60-in R-O-M belt powered by a 100-hp motor. Traveling 260 fpm, the 247-ft belt elevates 900 tph of raw coal to the top of the breaker house. There the 4x0 is scalped off and the larger material flows to a McNally Pittsburg rotary breaker that reduces it to 4x0 and also removes large pieces of rock. The raw 4x0 then feeds to a 48-in belt conveyor that elevates it 83 ft and discharges it into a two-way steel chute equipped with a motorized gate. The chute discharges onto a 48-in reversible belt conveyor that extends 96 ft to the center of two 5,000-ton raw-coal stockpiles. The two stockpiles permit the Nos. 11 and 12 coals to be stored separately and then blended before washing. To prevent degradation and segregation as coal is added to the piles, lowering chutes are installed in the center of each pile.

Adjustable belt feeders under the stockpiles deliver the two coals to a common point where they are mixed before dropping onto a 48-in belt conveyor. This unit elevates the blend to an 18x60-in scraper conveyor that distributes it equally to four 6x16-ft Allis-Chalmers Ripl Flo vibrators. These split it into 4x3/8 and 3/8x0 sizes and there also is provision for drawing off 1¼x3/8 for the heating furnace and the truck bin.

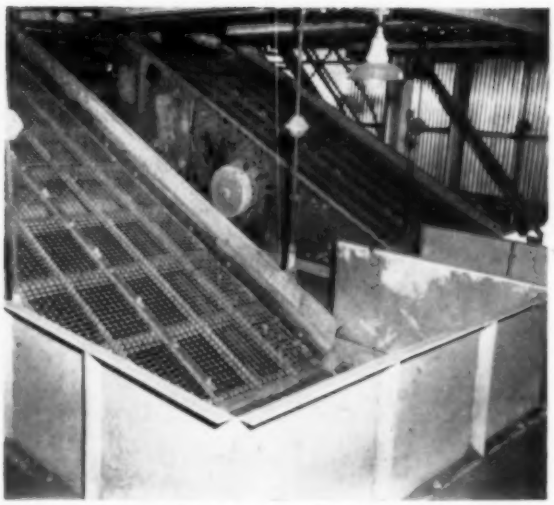
The 4x3/8 is cleaned in two McNally Norton improved automatic washers. Refuse is sluiced to a refuse sump in concrete-lined sluices and then is pumped through a 12-in pipeline to either of two refuse ponds.

Clean coal is discharged onto stationary screens with ¼-in openings before flowing to the washed-coal dewatering shaker screen where it is separated into 4x1½, 1½x3/8 and 3/8x0 fractions. The 4x1½ is broken to 1¼x0 by two McNally Pittsburg 36x60-in Gearmatic crushers. The 1¼x3/8 passes directly to the belt carrying coal to the clean-coal stockpile. The 3/8x0 joins the ¼x0 from the stationary screens and flows to two drag tanks. Two screw conveyors deliver the concentrated 3/8x0 to a Reineveld centrifugal dryer for final dewatering before going to the stockpile. Effluent from the dryer flows over a stationary screen equipped with ½-mm bronze Wedge Wire screen. Any plus ½-mm material is recirculated to the drag tanks and the underflow passes to the refuse sump.

Combined products from the shaker screen and centrifugal dryer are carried to the 5,000-ton washed-coal stockpile by a 42-in belt conveyor. Coal is discharged into a lowering and withdrawing chute that prevents excessive degradation and segregation. Chutes in both the clean- and raw-coal stockpiles are painted with a bitumastic coating to prevent corrosion. The three stockpiles are force ventilated by American Blower fans that deliver

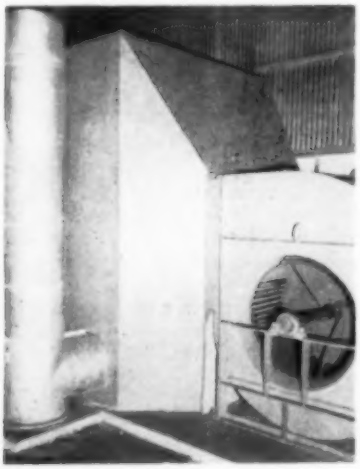


WASHING 4x⅜ is done in two of these washers that make three-product split. Refuse moves to sump in concrete-lines.



RAW-COAL SIZING ahead of washers is done by four 6x16-ft vibrators that split blended coal into 4x⅜ and ⅜x0 sizes.

CENTRIFUGAL DRYER dewaters ⅜x0, puts it on stockpile belt.

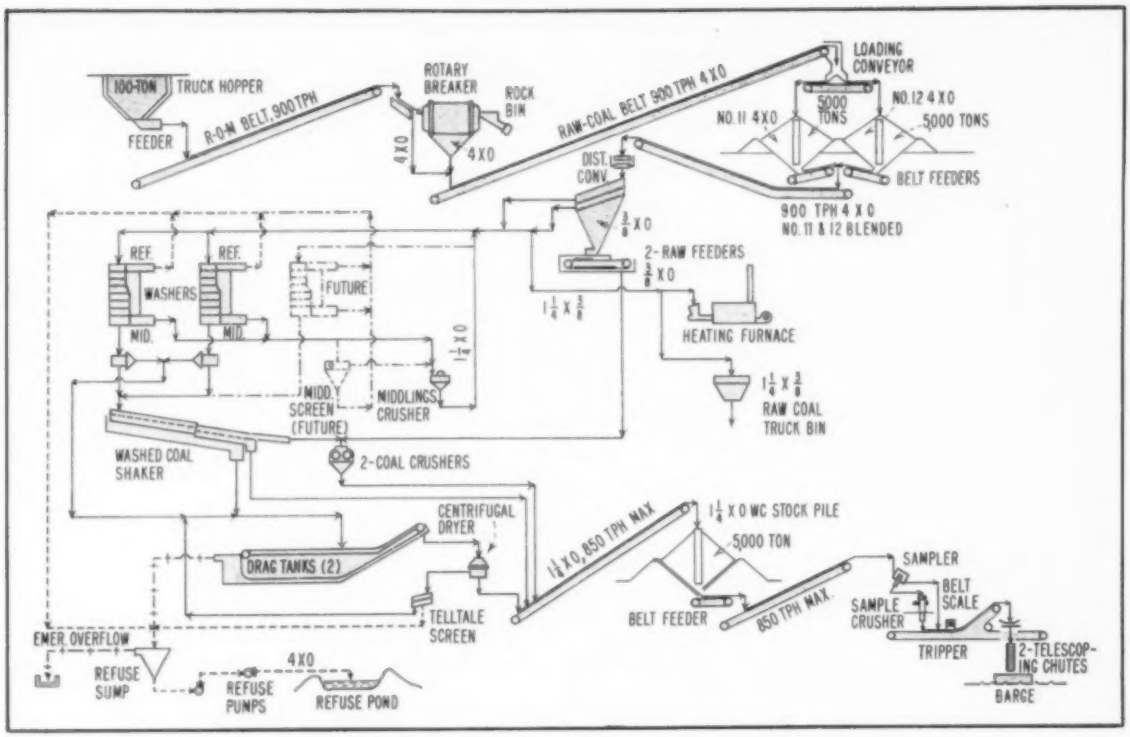


HOT AIR FURNACE provides heat to concrete duct in plant foundation.

Efficient methods and machines in preparation and modern coal laboratory insure uniformly high quality of Gibraltar's product.

LABORATORY to analyze coal is equipped with a heat pump for air conditioning and heating.

DISCUSSING PROBLEMS are Ervin Baker, Gibraltar superintendent, and L. E. Briscoe, electrical engineer.



HOW coal is stockpiled, washed and loaded into barges at the Gibraltar mine.

1,000 cfm at ¼-in water gage through ducts beneath the piles.

The washing and drying section of the preparation plant is heated by an unusual hot-air system. A 3x3-ft concrete conduit in the foundation of the plant serves to carry hot air around the perimeter of the building. At regular intervals in the top of the conduit there are vents installed to permit the hot air to escape upward. Since the plant is built with open steel flooring the heat can travel upward throughout the plant. An L. K. Campbell furnace provides the hot air.

Gibraltar preparation facilities were designed and built by the McNally Pittsburg Mfg. Corp. Concrete foundation work was contracted to George E. Detzel Co., Cincinnati, and dock cells were installed by the Maxon Construction Co., Dayton. All plant controls were supplied by Westinghouse and all motors by Allis-Chalmers.

BARGE LOADING

Coal from the stockpile is started on its way to the 1,500-ton barges by a 60-in belt feeder discharging onto a 42-in belt conveyor that terminates at the dock. This conveyor is protected by 225 ft of Armco tunnel liner from the center of the pile to where belt is above ground.

As the coal continues on its way it is sampled regularly by a McNally Pittsburg automatic sampler. The automatic device can be set to take 5, 10 or 15% of the sample and crush it to 8Mx0 in a Sturtevant crusher. Samples may be taken at any desired interval from 3 to 100 min.

After passing the sampling point, the coal drops onto the tripper belt that extends over the center of the canal. A Merrick Weightometer weighs the coal on the tripper belt, which delivers to a 48-in reversible shuttle belt for actual barge loading. The shuttle belt travels along the tripper belt at an angle of 90 deg.

Two telescopic lowering chutes on either end of the reversible belt direct coal to barges. The telescopic chutes are made up of eight cylindrical aluminum sections that give a total range of 36 ft in loading level. Paddle switches automatically elevate chute sections one at a time as the level of the coal in the barge changes, and the barge sinks further into the water. A pushbutton in the operator's station on the tripper belt also permits the operator to control the chutes at will.

The dock structure is made up of 10 cells that support the framework of the tripper belt and also serve as anchoring points for the barges. Special self-adjusting barge anchors, designed by Robert Holmes & Bros., move up or down as the level of the barge changes.

The Green River Towing Corp. handles the barges between the Gibraltar dock and the Yankeetown dock. The American Barge Line Co. then takes them to the Madison plant. Each tow is made up of four of the 1,500-ton barges.

It takes three full days for a tow to travel to its destination. A tow can be loaded or unloaded in 8 hr. Thus the complete loading, hauling and unloading cycle takes 3⅔ full days.

To maintain a daily check on the quality of coal shipped from Gibraltar and also provide management with information on plant performance, the company maintains a complete laboratory where samples are analyzed immediately for ash and moisture. Float-sink tests also are an important task assigned to the laboratory force. All laboratory results are tallied on a special sheet through the shift and at the end of the day the completed record is sent to Ayrshire's Indianapolis office where it is checked by the preparation engineer and added to other daily logs of the plant. All of the laboratory work at the mine is done in a building air conditioned with a General Electric Weathertron heat pump.

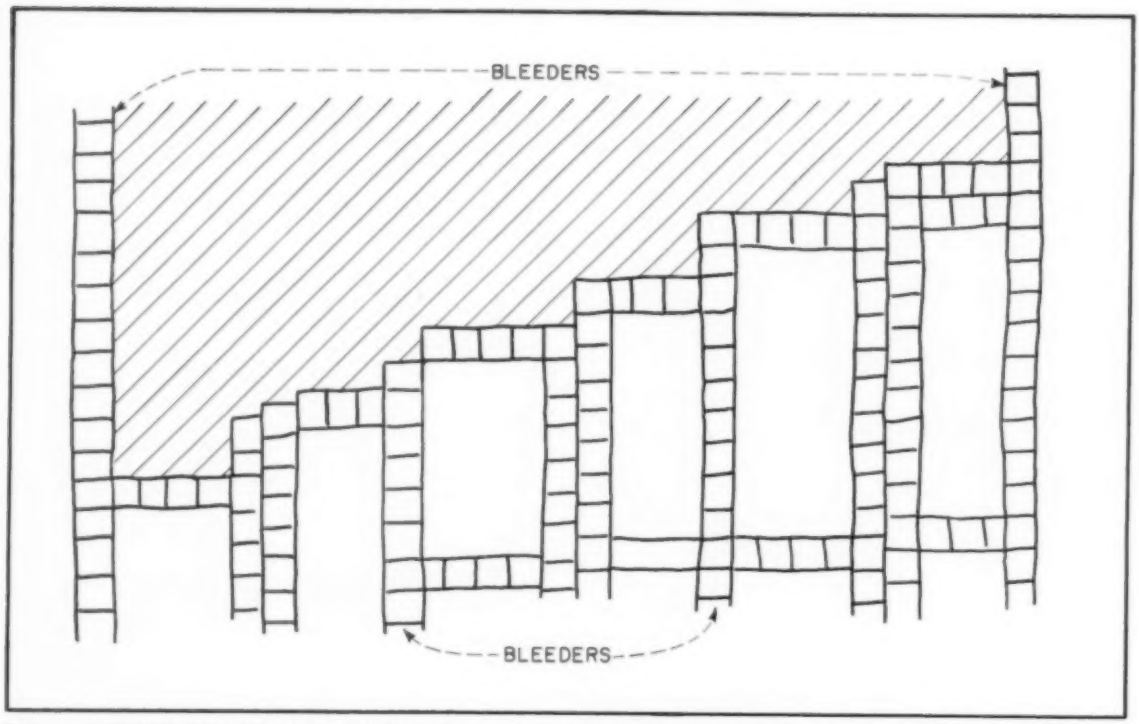


FIG. 1—STEPPED PILLAR LINE extending over several entries permits several machines to be concentrated in a given working territory. Machines recover room and entry pillars and drive new rooms.

Plans may be designed for concentration and high recovery

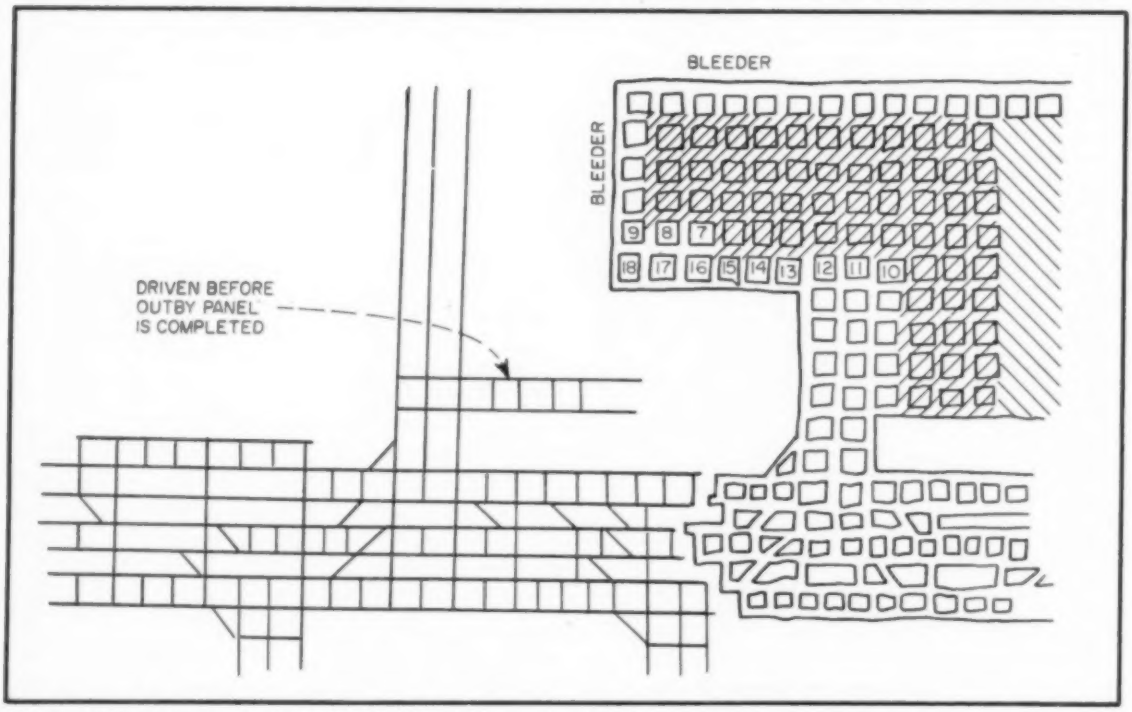


FIG. 2—COMBINATION ADVANCE AND RETREAT, as in this plan, is a widely used system of mining with continuous machines. This is designed for 85% to 90% recovery.

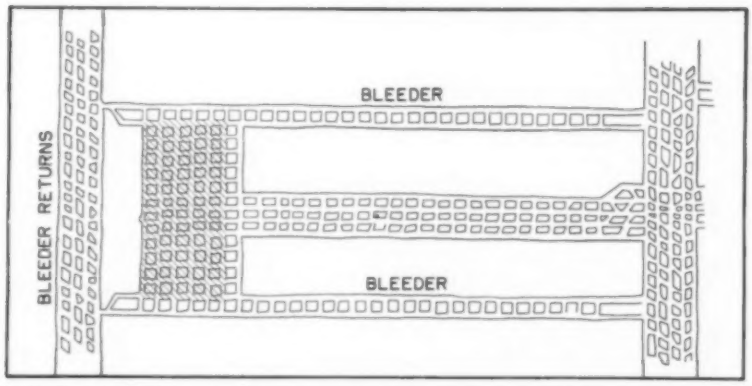


FIG. 3—FULL-RETREAT SYSTEM shown here provides for crisscross pillar extraction. Recovery of entry chain pillars are the final operation in retreat mining such as this.

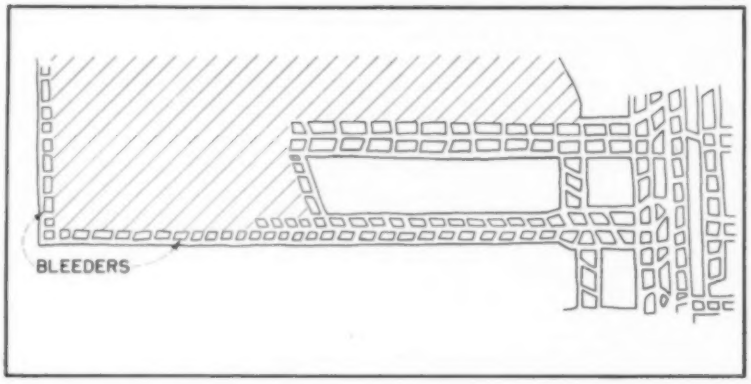


FIG. 4—ANGLE PLANS are employed at some mines, but are the exceptions rather than the rule. One aim in this system is to provide easier traveling for shuttle cars.

Pillaring With Continuous Miners

Open-ending growing as a method of extracting single pillars. Splitting and pocketing still widely used, however.

Support in pillaring predominately the old-reliable posts and crossbars, with bolting employed to a limited extent.

Individual panel development with one or two machines the most-common system. Plans with several machines on a common pillar line extending over several rooms or panels much in the minority.

Mining plans divided about half and half between (1) advance on one side and retreat on the other, and (2) full retreat. Bleeder entries or openings almost universally employed.

Ninety-degree work over three times more prevalent than angle work or a combination of angle and 90-deg.

Block plans far in the lead. "Flat" pillar lines the most common, especially in one- and two-machine panels.

PILLARING WITH CONTINUOUS MINERS so far is not too different from pillaring with loading machines or, farther back, pillaring with hand mining. One reason, perhaps, is the fact that the transportation equipment still is not radically different from that employed in the past. As new transportation devices—the bridge conveyor and the extensible belt, for example—find wider use, there may be a more-radical change. Even then, however, it is quite likely that the basic room-and-pillar pattern will still be apparent, as it has been so far in plans devised for the newer conveyor units.

SECTION PLANNING: Panel Systems Preferred

In part because the tendency so far is to use one machine—and not over two at the most as a general rule—per section, the panel is the most popular section unit. The exceptions are not numerous though there are a few. One is the plan illustrated in

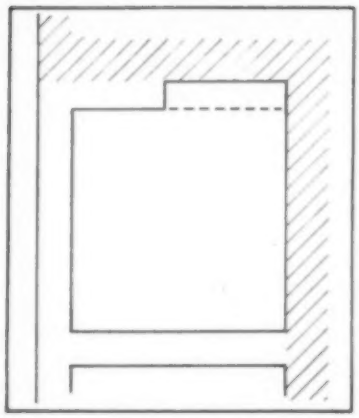


FIG. 5 — CONVENTIONAL OPEN-ENDING for blocks and rectangles.

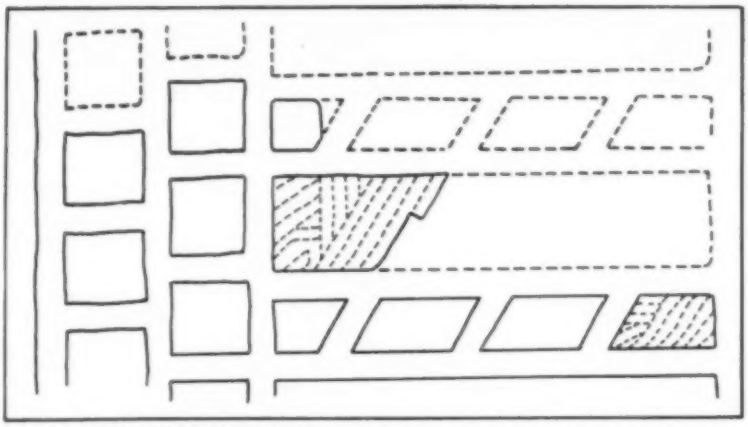


FIG. 6—ANGLE OPEN-ENDING combined with 90-deg development. Solid pillars between pairs of rooms provide much of the tonnage.

Open-Ending and Splitting

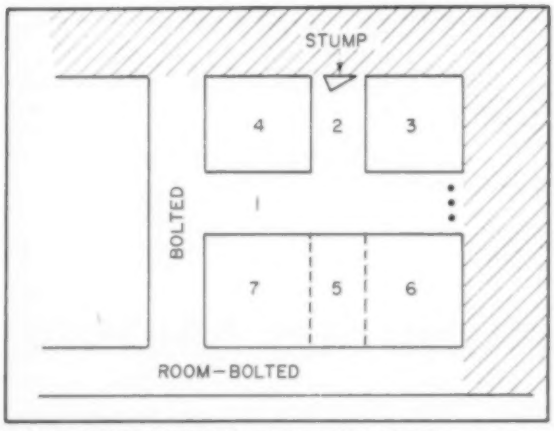


FIG. 7—CONVENTIONAL SPLITTING PLAN leaves big stumps on the corners for the final recovery operation.

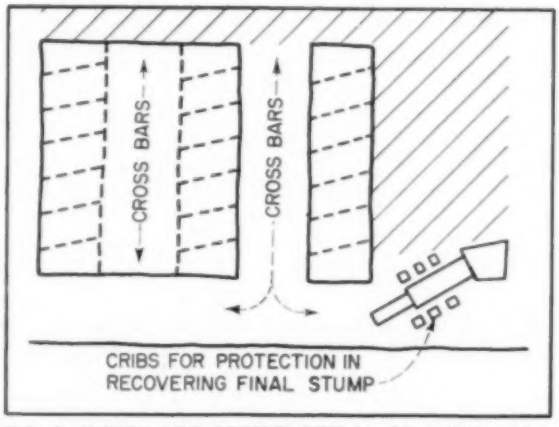


FIG. 8—WINGS ARE OPEN-ENDED in this splitting plan using cribs for final stump recovery.

Fig. 1, which provides for an extra degree of concentration in that there are several machines on one continuous pillar line—an average of one for every three blocks.

The ultimate in concentration so far proposed is up to 6 to 8 machines in a single panel consisting of several headings and working places turned to one side only. The basic plan is full retreat, with part of the machines recovering chain pillars, part recovering room pillars and part driving up new rooms to provide new pillaring places.

Ventilation and dust control became critical with such heavy concentrations, as does panel haulage and handling of supplies. This is in part because the entire mine production comes out of 12 to 15 places, which is nearly the ultimate in concentration. In this plan, even though work in the individual panels is full retreat, work over the mine is advance on one side to the boundary and retreat on the other, taking the main-entry barriers and chain pillars as the final operation in retreat.

Advance and retreat plans with one or two machines, usually one, vary considerably in detail though not in basic characteristics. Fig. 2 is an example of a recent plan designed for 85 to 90% recovery, using shuttle-car and belt haulage within the panel. One difference from the usual plan is the way mining is done on the retreat. One room is always open ahead of the one from which the pillars are being mined, and pillars are recovered from the headings out, working away from the gob section on the advance side. The machine is trammed back to the entry to start each new row of pillars. This keeps pillar mining going in one direction and thereby eliminates a V in the pillar line in the middle of the panel.

One form of full retreat with working places turned both ways is shown in Fig. 3. "Criss-cross" pillar extraction, as shown, is the rule in this panel plan. No pressure or riding has been experienced, production is higher in the pillars, and excellent falls are obtained.

Panel plans providing for rooms on one side only are relatively infrequent in level coal. There are a few, however, mostly where rigid- or semi-rigid-head machines, which are less flexible in turning at 90 deg, are used. One, providing for full retreat, is shown in Fig. 4. One aim in angle work is easier travel for shuttle cars and easier turning of places with rigid- or semi-rigid-machines. Many operators, however, hold that even

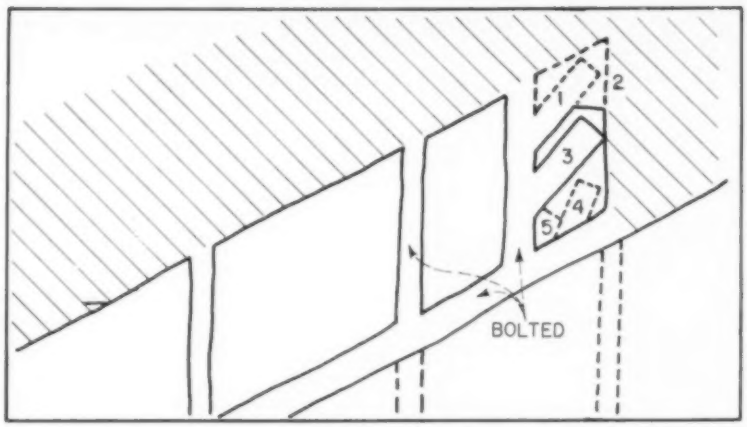


FIG. 9—WINGS in this angle plan resulting in diamond-shaped pillars are mined by pocketing in five successive stages.

with such machines the advantages of angle projection are more than offset by those of the 90-deg system, leaving the latter in the preferred position. One advantage of 90-deg work is greater uniformity in pillar shape. A second is fewer complications in development and room-driving.

Alternatives providing part of the advantages of both the angle and 90-deg plans normally are based on driving entries and rooms on 90-deg, while crosscutting and pillaring in rooms on 45 to 60 deg. Figs. 6 and 13 are examples. Rigid-head machines are employed in both instances.

Practically all the plans illustrated include bleeder openings. Usually, as indicated, these are made by leaving in room or chain pillars, either permanently, as at the tops of panels (Fig. 2), or temporarily until recovering of the next panel starts, as in Fig. 4. Special bleeder entries may be provided between the regular production entries, as in Fig. 1, or between groups of panels, as in Fig. 3. These may be in addition to openings at the sides or tops of panels (Fig. 3).

PILLAR TYPES: Blocks In the Majority

Coal mining in the past quarter century has been marked by a slow increase in the use of block systems. The trend seems to have been accelerated by the advent of the continuous machine, which was accompanied by an increased need to get all the coal possible in view of rising costs.

Blocks can be diamond-shaped and also equal-sided. However, the tendency is to apply the term "block" to any pillar that is more nearly square than rectangular.

One of the plans studied in compiling this report of pillaring with continuous mining is based on 85x85-ft blocks. The majority, however, run from approximately 60x60 to 70x70 ft. The smallest studied is 45x45 ft.

Establishing the size of the block, or the conventional rectangular pillar, involves, among other things, choosing between the risk of roof deterioration and other troubles in driving long pillar lifts, and the extra trouble and cost, if any, of establishing new lifts, including any extra timbering at the mouth of the lift and additional time in jockeying to get the lift started. If the plans developed to date are a reliable indication, the most desirable length of lift, in the absence of special conditions, is 60 to 70 ft.

Very thin pillars are provided for in some plans for both flat and pitching coal. One goal is fixing it so that the miner can reach through them with a minimum of timbering in addition to the regular room timbering and perhaps a crossbar or extra posts at the mouth of the lift.

OPEN-ENDING: Basic Plans And Modifications

The speed with which a lift can be mined with continuous machines has been one of the factors contributing to the increase in open-ending of pillars. This eases the support problem enough so that opportunity can be taken of the other advantages of open-ending. One is that open-ending is, in many respects, much simpler not only in driving the lift but in ventilation and ease of maneuvering equipment.

Fig. 5 is a typical full open end plan. Mines using it or modifications include the following:

1. Thick coal, 18 to 24 in draw-slate, 12 in top coal left. Ripper-type machines used to recover old room pillars. Support in 12-ft wide lifts provided by 5x6-in crossbars on 5-ft centers, with special 15-ft-long bars at intersections.

2. Thin coal, 42 in. excellent top. Semi-rigid machines, 45x45-ft blocks, support rarely required.

3. Thick coal, 7 ft recovered, 1 ft left against fair to bad top. Ripper-type machines, 80-ft blocks, posts and crossbars.

4. Thick coal, soft gray shale top. Rigid-head machines, 52x52-ft blocks, posts normally used for support in lifts.

5. Thin coal, 48 in average, weak to fair top. Angle plan (Fig. 4) with rigid-head machines. Pillars 20 ft through. Support by posts along gob edge of lift and at the face.

Modifications of the open-end plan include leaving pegs or small stumps of coal on the gob side at the start of the lift for extra support. Another variation is taking two or three lifts and then leaving a wing or fender, say 6 ft through, to break the top and protect subsequent lifts.

A combination of solid and conventional room pillars characterizes another modification for rigid-head machines shown in Fig. 6. This plan also shows one method of combining 90-deg development with angle pillaring in rooms. The top is a medium-hard shale over which is laminated shale and coal. Rooms 16 ft wide are driven on 50-ft centers, leaving solid pillars 59 ft thick on the gob side. These solid pillars are recovered by open-ending on 45 deg, using posts along the gob edge of the lift. Clumps of posts on close centers are interspaced with posts on regular centers as necessary. Room pillars then are extracted in the same manner. Room and pillar centers were arrived at after several trials, and provide maximum lift length commensurate with rate of roof deterioration and other factors, including cost of preparing for new lifts.

SPLITTING: Used With All Types of Miners

Splitting plans for continuous miners include the conventional one shown in Fig. 7. The coal is 8½ ft thick and the top normally is a soft gray shale. Falls are fairly easy to get. Ripper-type machines drive places 14 ft wide for 58x58-ft pillars, which are mined in the sequence shown. Rooms and crosscuts are bolted. Props and small pegs or stumps are used for support in the pillar openings.

Modifications of the splitting plan

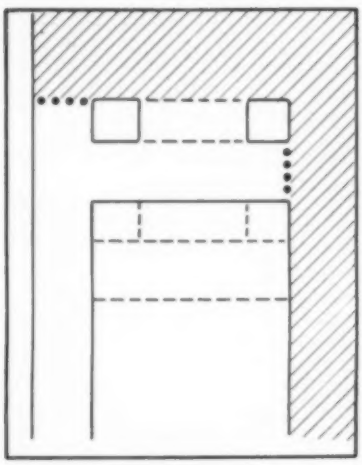


FIG. 10—POCKET-AND-WING PLAN of the conventional type.

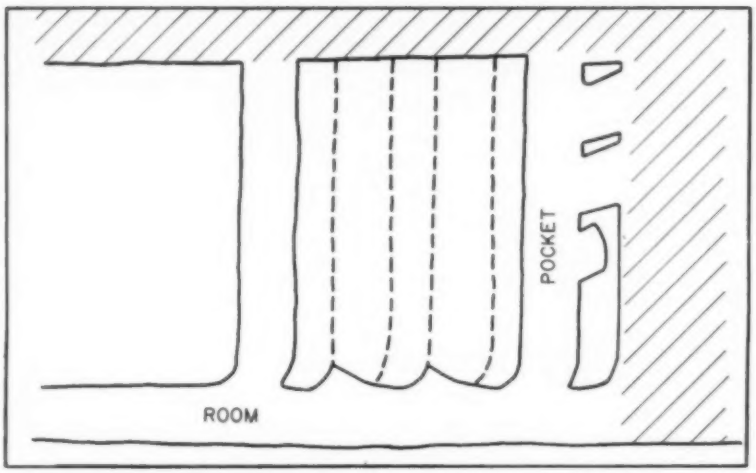


FIG. 11—WINGS in this pocket plan are mined by subsidiary pockets leaving small stumps for protection in final extraction.

Recovery by Pocketing

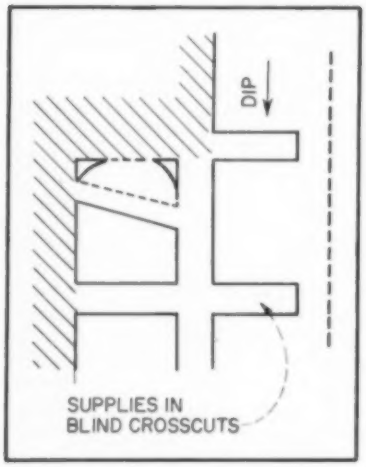


FIG. 12—PITCH PLAN employs pocket driven on slant.

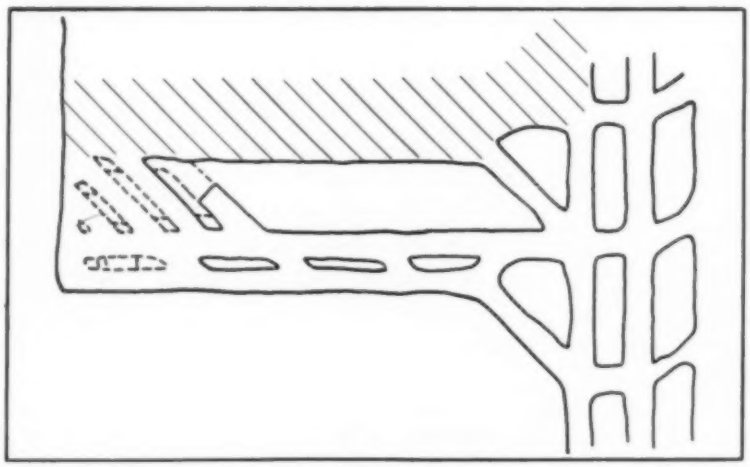


FIG. 13—ANGLE POCKETS with thin fenders distinguish this plan with basic development on 90 deg with rigid-head equipment.

include open-ending of the pillar halves at one mine (Fig. 8). Average coal thickness is 60 in. The top is 12 in of drawslate and includes kettle-bottoms, slips and horsebacks. Semi-rigid machines drive rooms and crosscuts 17 ft wide to form 56x53-ft blocks, which are split lengthwise. The halves then are open-ended in lifts 9 ft wide. Support in rooms and crosscuts is by crossbars held up by bolts. In pillar splits, the end of the bar next to gob-side half is held by a bolt, with the other end on a post. Thus interference is reduced and the posts act as breakers when the second half of the pillar is removed. In taking the final lift in removing a pillar half, cribs are erected on both sides of the miner.

A splitting plan for diamond-shaped pillars and rigid-head machines is shown in Fig. 9. A similar plan also is used with square blocks and ripper or rigid-head machines at other mines. Rooms and crosscuts are driven to form 60x70-ft pillars at the mine using the Fig. 9 plan. Coal thickness is 4 to 6 ft, with a firm shale top. Rooms and crosscuts are bolted, but fast extraction permits completing the 9½-ft wide lifts in the two pillar halves with posts only.

POCKETING: Versatile System for All Units

Pocketing differs from splitting mainly in the thickness of the coal strip left against the gob, whether the strip be called a fender, a wing or by some other name. Some use the term fender when the pillar is thin—under, say, 3 ft in thickness. Wings, under this system of terminology, therefore are pillars thicker than 3 ft.

What might be called the conventional pocket - and - wing system is shown in Fig. 10. It may be used with either rectangular pillars, as in Fig. 10, or with blocks. Fig. 11 shows a block plan. Block size is 85x85-ft, formed by driving places 15 ft wide with ripper-type miners. Pockets are driven 15 ft wide leaving wings 10 ft thick, which are cut through at intervals to leave small stumps. The roof where this plan is employed is top coal and drawslate, with major support by roof-bolts installed by

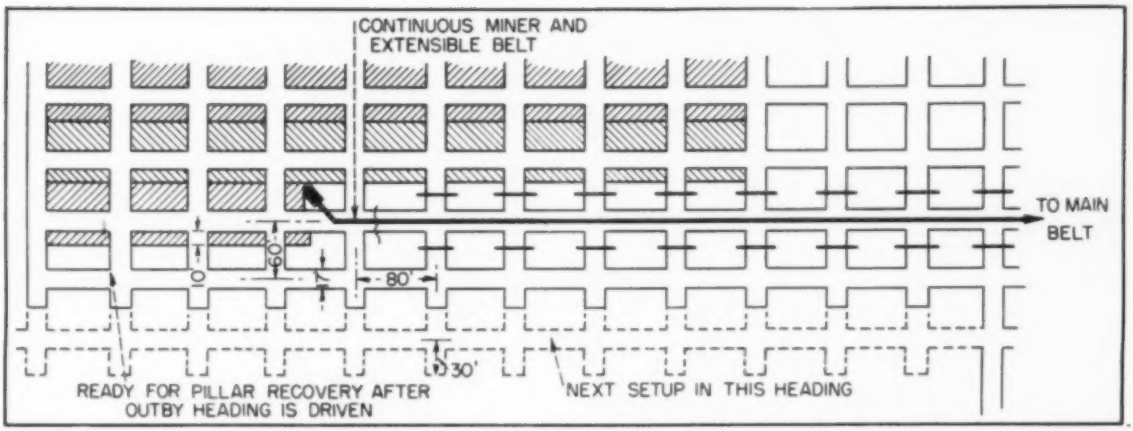


FIG. 14—SPECIAL MODIFICATION of basic room-and-pillar plan is employed to take advantage of extensible-belt characteristics. Places are 1,000 ft. deep.

bolting units on the miners. Once a major break line is established, falls come regularly every 2 or 3 lifts.

Where stumps are left, their size depends on whether it is intended to take them out with the miner, in which case they can be fairly large, or whether it is intended that they crush, meaning that they would be fairly small. Since drilling equipment would normally have to be provided specially on continuous-miner sections, shooting of stumps is a relatively infrequent system, although done in some instances.

Mining pillars on pitches with ripper-type continuous machines has produced pocketing plans very similar to those employed in flat coal. Fig. 12 is an example. Coal pitch is 17 deg maximum. Rooms are 18 ft wide on 45-ft centers. To recover the pillars a slanting chute, or pocket, is driven across the top end, with crossbars at the mouth to protect the operator while the machine reaches through. The machine then cuts through the wing in semicircular fashion. If possible, the stumps then are taken. If not, they are shot to insure the necessary roof break.

Pocket-and-fender plans include the one for rigid-head machines in thick coal and fair to good roof shown in Fig. 13. It will be noted that while entries and rooms are on 90 deg, final pillar recovery in rooms is on an angle. Rooms also are driven in pairs, with thin pillars between the individual rooms and thick pillars between pairs of rooms. These thick pillars are mined by driving successive pockets across the ends, leaving fenders 4 to 5 ft thick. The final operation consists of mining out the centers of the fenders as the machine pulls back out of the pockets.

SPECIAL PLANS: New-Unit Characteristics Utilized

There are three major reasons for the introduction and growth of the room-and-pillar plan in coal mining in the United States:

1. Room-and-pillar is simple and has been proved under a wide variety of conditions over many years.

2. Room-and-pillar is flexible. In one form or another it is used in thick coal and thin, flat coal and pitching, and with all types of roof.

3. Cover thickness seldom is over 1,000 ft and usually is less than 500 ft. When the depth of cover averages more than approximately 1,500 ft, experience abroad shows that room-and-pillar is chancy at best and frequently cannot be used at all. This results from the fact that sufficient driving to make pillar mining possible removes so much coal that the remainder, even with reasonable timbering, cannot support the weight. Therefore, replacement of the coal by sufficient artificial support to retard, control and limit subsidence is necessary. Consequently, longwall with packwalls is most practical.

Coupled with the fact that the tendency is design equipment for room-and-pillar application, it is not surprising to find that even the newest plans usually are based on some modification of the system. The major exception is longwalling with coal planers, which is picking up new recruits from time to time, particularly in the thinner seams.

One room-and-pillar modification designed to make use of the special characteristics of the extensible belt is shown in Fig. 14. Rooms in this plan become "headings" 1,000 ft deep. As originally set up, the plan calls for extracting pillars on the right of the place completely, and for taking a 10-ft cut off the pillars to the left. In this process, the miner alternates from side to side as it retreats out of the heading. After the pillars are recovered from one setup, the miner leapfrogs the next heading (previously driven to its limit), and drives a new heading 1,000 ft to the limit of the extensible belt.

The next step is tramming the head and tail sections of the belt, as well as the miner, back to the previous heading. The intermediate sections and belt are left in place in the newest heading for use when the pillars are recovered in that particular opening. Therefore, only a minimum of time is needed to put the belt back into operation when the miner and end sections are trammed back.

Top Benching—Coal over, say, 9 to 10 ft in thickness has always presented a problem in pillaring, whether loading was done by hand, by loading machine, or by continuous miner. All the earlier systems, involving driving rooms and crosscuts on the bottom and then working up resulted in trouble and loss of coal, not to mention the extra hazard to personnel.

With the advent of roof-bolting, top-benching with both loaders and continuous miners has become increasingly the practice in thick coal. Development is the same as in the past, except that it is done next to the roof instead of along the bottom. This permits securing the roof by bolts and eliminates the need for long posts and heavy collars, which normally are inadequate for the job. After the rooms and crosscuts are driven in the top, the bottom coal is removed by ramping down in the rooms and also in the open-end or split places in the pillars.

NEW CLEANING PLANT incorporating coarse- and fine-coal facilities upgrades former steam coal to metallurgical quality for Joanne Coal Co. at Rachel, W. Va., thus increasing coking-coal reserves.

Better Cleaning Produces More

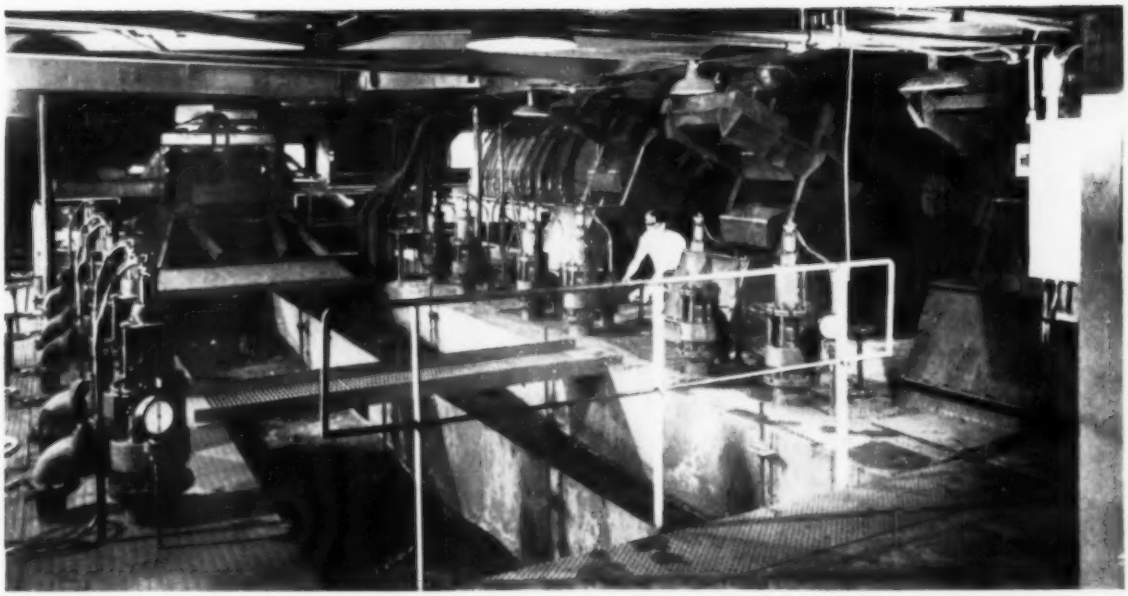
New plant of Joanne Coal Co. employs latest-type jig and wet tables to extract up to 25% more metallurgical coal from its R-O-M. Feed for filtering circuit is provided by 80-ft thickener.

FINE-COAL washing is handled by a battery of 14 wet-washing tables. Feed includes raw ¼x0 and crushed middlings.

UPGRADING the overall quality and boosting the yield of metallurgical coal by 25% rate among the top benefits the Joanne Coal Co. is reaping from its new preparation plant. Located 12 mi from Fairmont, W. Va., the new facilities are capable of washing and drying 350 tph of Pittsburgh seam coal. Plant features include jig washing, wet tabling, mechanical and thermal drying and filtering.

Joanne Coal Co. is a subsidiary of the Sharon Steel Corp., which has plants at Farrell and Sharon, 45 mi northwest of Pittsburgh. The Baton Coal Co. of Pittsburgh are operating managers and exclusive sales agents. The steel company relies on the mine for a large portion of its coking coal, but Joanne is limited in the quantity it can supply because of the sulphur content in coal in some areas of the mine. However, the new cleaning plant has improved this situation considerably. And now more of the mine output can be diverted to steel making.

Thorough engineering studies were made before the plant was built to determine how much the coal could be upgraded. Analysis of washability data showed that low sulphur and low ash could be expected in the fine sizes. Therefore the company decided that two processes should be used to



COARSE-COAL WASHING is assigned to air-pulsated wash box with dual washing beds. Unit features close control over entire washing area. Six individually controlled refuse draws and absence of hutch screws are other wash box features.

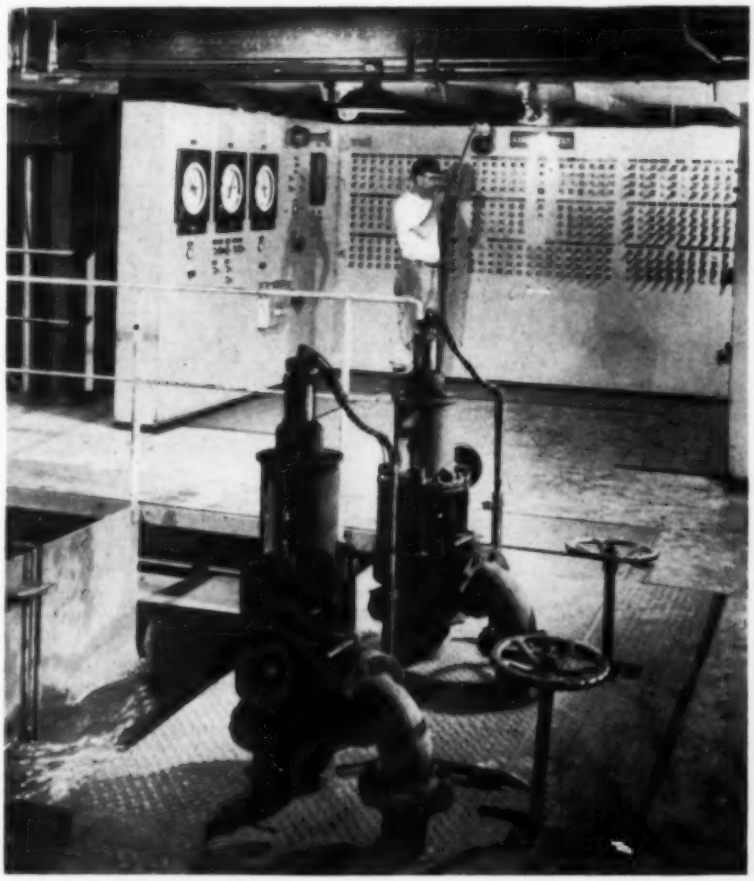
Coking Coal

get the best possible product and a maximum of metallurgical coal. One of the prime goals in designing the plant was to remove as much sulphur as possible. To achieve this, separate equipment was selected for cleaning coarse and fine coal.

The plant was built by Link-Belt and was designed in co-operation with the engineering department of Baton Coal Co. Preparation experience of both companies was used in working out the details of the coal flow after careful study of all the problems from the viewpoint of getting as much metallurgical coal as possible. Special emphasis was placed on plant flexibility, particularly in storage and blending.

Coal is hoisted to the surface in 3½-ton mine cars by a 750-hp Vulcan hoist. It is dropped into a 700-cu ft hopper fitted with a power gate that permits rock to be hoisted and diverted to a Link-Belt apron feeder discharging into a 1,000-cu ft rock bin. Rock is either loaded into trucks or an aerial tram for disposal.

Raw coal falls onto a manganese-steel apron feeder which has a Memco electro magnet suspended over the discharge end to remove tramp iron from the coal before it passes to the washer section. A heavy-duty Link-Belt 5x12-ft vibrator then scalps off



CENTRAL PANELBOARD is nerve center of new cleaning plant. Operator can observe and control the operations of wash box and filter from here.

HOW COAL FLOWS through the new Joanne cleaning plant.

Electric-Drive Applications at Joanne Plant

Unit No.	Quantity	Hp	Rpm	Description of Unit
1	1	7½	1,750	Apron feeder
2	1	.....	.....	45 in Circular magnet, 2,000 w DC
3	1	5	1,750	R-O-M Vibrating screen
4	1	75	1,150	R-O-M Crusher
5	1	50	1,750	Raw coal conveyor No. 1
6	1	1	1,150	Flop gate in discharge chute of raw coal conveyor No. 1
7	1	.....	.....	Brake for unit No. 6 above
8	2	.....	.....	Limit switches for flop gate of unit No. 7 above
9	1	3	1,750	Storage bin feed conveyor No. 1
10	1	3	1,750	Storage bin feed conveyor No. 2
11	4	.....	.....	Raw coal electric vibrating feeders
12	1	3	1,750	Raw coal conveyor No. 2
13	1	50	1,750	Raw coal flight conveyor No. 3
14	2	½	1,750	Wash box refuse gates
15	2	5	1,750	Wash box refuse elevators
16	1	1½	1,750	Wash box eccentric drive
17	1	½	1,750	Wash box air compressor
18	1	75	1,150	Wash box blower
19	2	20	1,750	5x0 Clean coal dewatering screens
20	1	3	1,750	Thickener drive
21	1	3	1,750	Vacuum filter drive
22	1	1½	1,150	Vacuum filter blower
23	1	100	1,150	Vacuum pump for filter
24	1	5	1,150	Filtrate pump
25	1	20	1,750	¼x0 Clean coal drag conveyor
26	1	75	1,150	Middlings crusher
27	2	7½	1,750	¼x0 Clean coal dewatering screens
28	2	1	1,750	Distributors
29	14	3*	1,150	Tables
30	1	7½	1,750	Crusher feed conveyor
31	1	75	860	24x42-in roll crusher drive
32	1	3	1,750	Crushed coal screen
33	3	60	1,750	Centrifugal dryers
34	1	7½	1,750	Centrifugally dried coal conveyor
35	1	25	1,750	Heat dryer feed conveyor
36	2	7½	1,750	Heat dryer screw feeder drives
37	1	10	1,750	Heat dryer feed & discharge screw conveyor
38	1	15	1,750	Heat dryer feed & discharge screw conveyor
39	2	3	1,750	Heat dryer spill screw conveyor
40	2	30	1,750	Heat dryer drives
41	1	2	1,750	Heat dryer air compressor
42	1	1	1,750	Furnace feeder
43	2	15	1,750	Heat dryer exhaust fans
44	1	5	3,600	Overfire air fan
45	1	15	1,750	Forced draft fan
46	2	½	1,750	Dust collector valves
47	1	3	1,750	Dust screw conveyor
48	1	3	1,750	Dried coal conveyor No. 1
49	1	20	1,750	Dried coal conveyor No. 2
50	1	20	1,750	Dried coal conveyor No. 3
51	1	.....	.....	Dried coal electric vibrating feeder
52	3	.....	.....	Limit switches—fuel bin indicators
53	1	50	1,750	Dried coal conveyor No. 4
54	1	½	1,750	Automatic sampler
55	1	10	1,750	2x¼-in Clean coal conveyor
56	1	5	1,750	Refuse dewatering vibrating screen
57	1	3	1,750	Ash conveyor
58	1	7½	1,750	Refuse belt conveyor
59	1	150	900	Main circulating pump
60	1	10	1,750	Centrifugal dryer effluent pump
61	1	15	1,750	Filter feed pump
62	1	20	1,750	Drag tank overflow pump
63	1	50	1,150	Table feed pump
64	1	⅓	1,750	Pressurizing fan for control room
65	1	5	1,750	Rock apron feeder
66	1	7½	1,750	Dried coal transfer conveyor
67	1	7½	1,750	Slurry pump
68	1	3	1,750	Primary refuse dewatering screen
69	2	1½	1,200	Rock flop gates
70	2	1	1,200	Storage bin feed gates
71	1	1½	1,750	Refuse thickener mechanism
72	1	5	1,750	Centrifugal dryer feed conveyor

the plus 5-in material and delivers it to a McLanahan & Stone Rockmaster crusher for reduction to 5x0. The crusher product and vibrator underflow combine on the 36-in raw-coal belt and flow to two feed belts mounted over four 500-ton raw-coal storage bins.

RAW COAL STORAGE

A power gate, operated from a control board near the raw-coal hopper, directs the coal to either of two storage-bin belts, each of which may feed one of two bins. Power gates at the ends of the storage-bin belts deflect the coal to the desired bins. Coal on either of these belts in turn may be diverted to either of two bins by power gates. The flexibility in this distributing system permits four different grades of coal to be stored separately.

Under each bin there is an adjustable 48x60-in Jeffrey-Traylor Type 5H feeder fitted with a selenium rectifier and rheostat control. Each of these units can handle 150 to 350 tph and thus can supply part or all of the feed for the plant. All of the feeders discharge to the No. 2 raw-coal belt which serves as a blending conveyor. It then flows to a flight conveyor and is discharged into a Link-Belt air-pulsated wash box.

A Trans-Weigh belt-meter on the No. 2 raw-coal belt weighs the coal as it leaves the storage bins. The weight is registered on a dial on the main panelboard and also is recorded on a chart by a remote computer. By observing the dial and indicator lights on the panelboard, the plant operator can tell when one of the bins is empty. He then can change the feed from one bin to another merely by pushing a button. Plant motors and controls were supplied by Westinghouse. Easy communication between the men stationed at various key points in the plant is provided by a Femco system.

PRIMARY WASHING

The wash box is the largest unit built to date by Link-Belt and incorporates many new design features. Among these are dual washing beds, dual air chambers, one refuse elevator, two middlings elevators, no hutch screws and six individually controlled refuse draws. The advantage of this machine over a conventional unit is said to be closer control over the entire washing area because of the two beds.

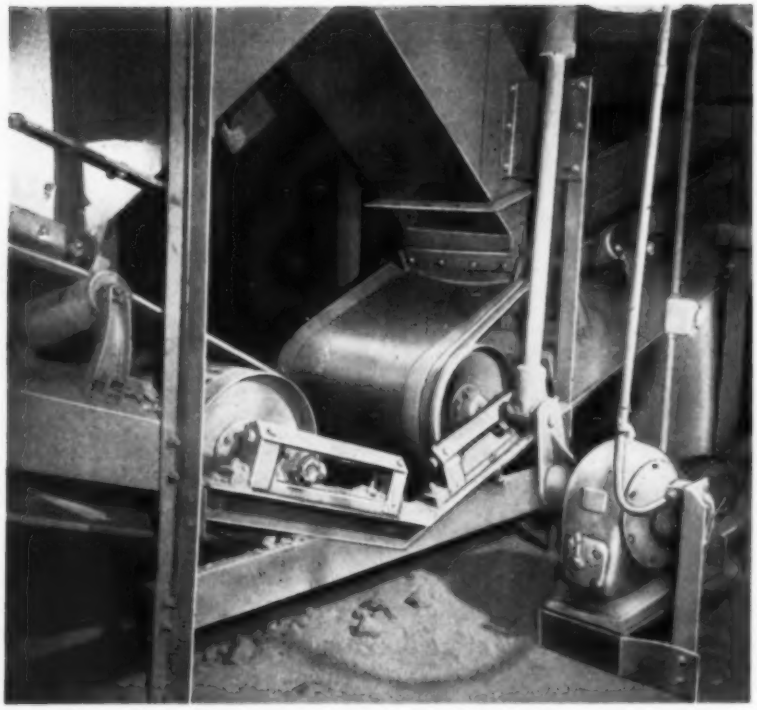
The feed is split evenly into two parts and directed to each of the dual washing beds by the windshield-wiper action of an arm immediately ahead of the wash box. Individual controls are provided for each of the washing beds. Three draws are made with the primary one passing directly to refuse. The intermediate and secondary draws are sent to a Jeffrey Flextooth crusher and reduced to ¼x0 which is cleaned in the table section.

Clean coal from the wash box passes over a fixed sieve with ¾-in openings and flows to a 6x16-ft Allis Chalmers double-deck Low Head dewatering vibrator for separation into 5x¾, ¾x¼ and ¼x0.

The 5x¾ can be sent to the old screening plant which is now used for sizing and loaded separately or mixed with the ¾x¼ and loaded as metallurgical coal.

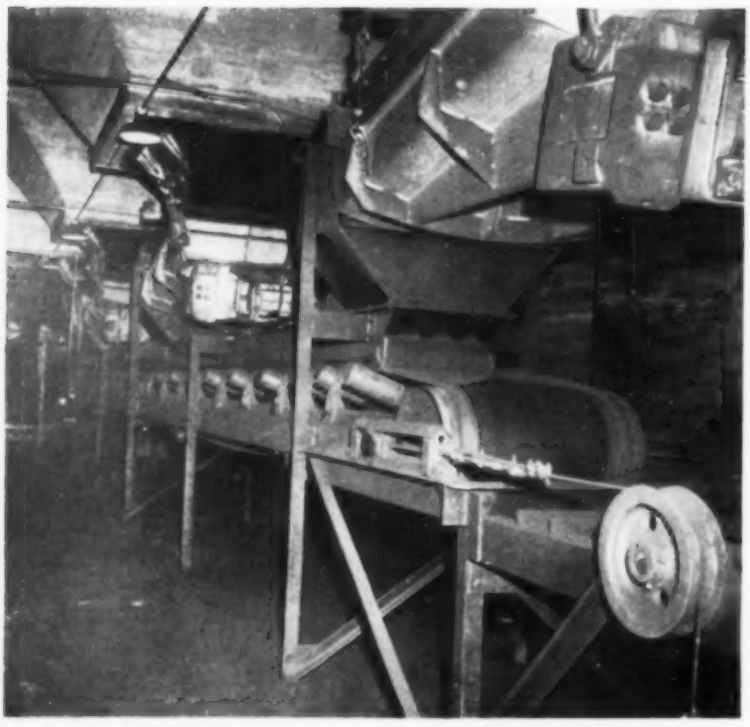
FINE-COAL WASHING

The ¼x0 from the dewatering



TWIN FEED BELTS deliver raw coal to 500-ton storage bins. Each belt serves two bins. Power gates direct flow to either belt and to bins.

Raw coal automatically delivered and blended



RAW-COAL BLENDING on belt conveyor is done with adjustable feeders, each with capacity of 150-350 tph, under storage bins. Coal then flows to wash box.

screens and crushed middlings flow to a 12x96-ft drag tank. Concentrated ¼x100M is conveyed to the end of the tank and delivered to a sump. From there a Barrett Haentjens pump picks it up and delivers it to two Concenco revolving feed distributors, each feeding seven Deister SuperDuty Diagonal-Deck wet-washing tables.

Table refuse is sluiced to a Link-Belt dewatering screen equipped with 28-mesh Wedge Wire screen cloth and is dewatered with the coarse refuse from the wash box. The 28Mx0 refuse flows to a thickener and is then pumped to a settling area. Part of the overflow from the refuse thickener is recirculated to the tables as dressing water and the remainder is used as circulating water.

Clean ¼x0 is sluiced over a 28-mesh Wedge Wire fixed sieve before passing to a pair of 6x12-ft Allis Chalmers Low Head dewatering vibrators. The ¼x28M flows to two Reineveld centrifugal dryers for mechanical dewatering. A third unit is maintained as a spare. The dried product discharges onto a 60-in flight conveyor, which transfers it to a 24-in flight conveyor where it is mixed with the 28Mx0 product from the disk filter and carried to a Link-Belt Multi Louvre heat dryer.

The underflow from the ¼x0 dewatering vibrators includes water from the screen feed plus the effluent from the centrifugal dryers. The combined products flow to an 80-ft Link-Belt coal thickener. A variable-speed diaphragm pump picks up the concentrated solids and relays it to a filter-feed sump for delivery to a Dorr Oliver 12-disk filter.

The filter cake passes to the flight conveyor carrying the coal from the centrifugal dryers and is delivered to the Multi Louvre dryer. Moisture on the filter cake averages 21%, ash 8 to 9% and the sulphur content is lower than in the ¼x28M.

To smooth plant performance, a high degree of flexibility has been built into the filtering circuit. For example, the filter feed can be bypassed to eliminate the filter cake from being fed to the drying circuit by itself. This condition would be possible when the flow of ¼x28M coal is broken.

Bypassing is done manually by the plant operator who can see the conveyor feeding the dryer from his work area. He also can see the feed to the wash box. When he sees enough ¼x28M in the dryer-feed conveyor he starts the filter circuit. The bypassed filter feed returns to the 80-ft thickener, which was designed to handle the extra material.

By exercising close control over the

FINAL DRYING of mechanically dewatered ¼x28M and 28Mx0 filter cake is accomplished in two thermal units.

CENTRIFUGAL DRYERS receive ¼x28M from vibrators and prepare it for final treatment in thermal units.

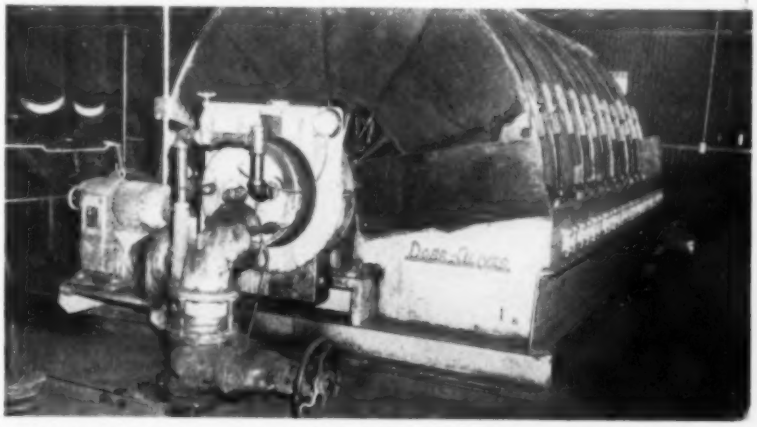
filter circuit the company eliminates trouble which might arise from the 28Mx0 clogging the dryer-feed conveyor or the dryer surge bins. In some instances the company reports that up to 2 hr of delay time has been eliminated.

The filter cake and the ¼x28M from the centrifugal dryers flow from two 25-ton surge bins to two Link-Belt Multi Louvre heat dryers. Each unit can handle 80 tph of feed with 9% moisture and yield a dry product with 3½% total moisture. The dried coal is carried by belt to a 500-ton storage bin, from which it is removed by a Jeffrey-Traylor feeder and delivered to the dried-coal conveyor, mixed with ¾x¼ from the dewatering vibrators and delivered to railroad cars.

Heat for the Multi-Louvre dryers is supplied by a Bigelow-Liptak furnace equipped with a Riley manual dumping-grate spreader stoker. Extremely fine coal from the heat dryers is recovered by American Air Filter Amerclones and mixed with the larger particles for loading into railroad cars.

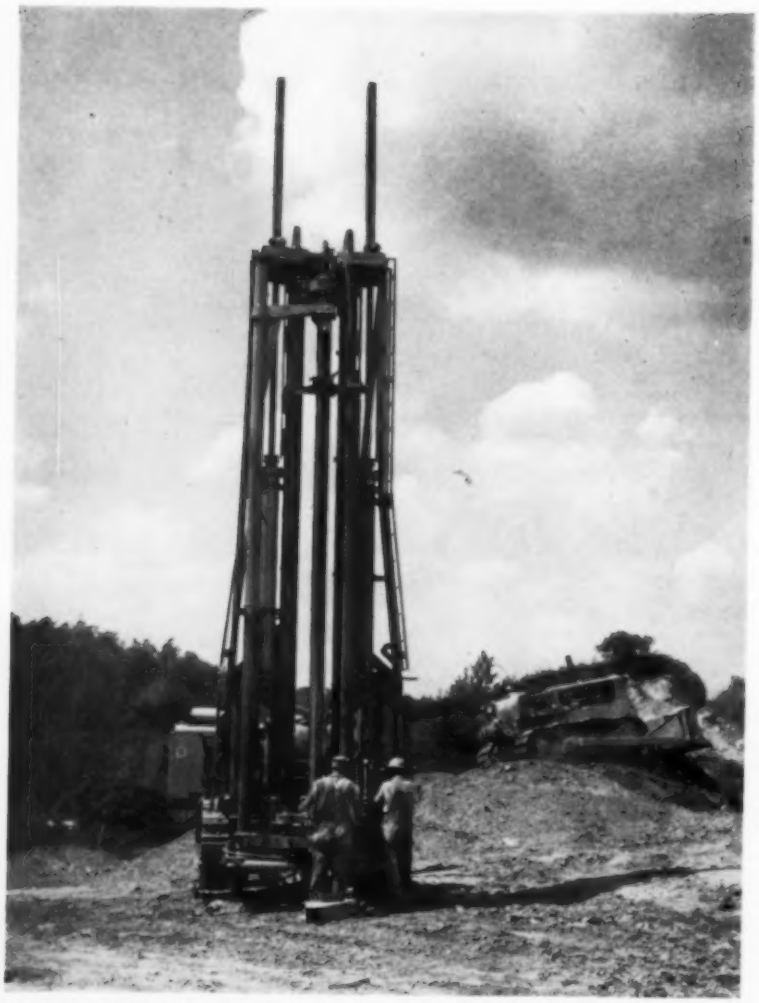
WATER SUPPLY

To provide a source of fresh water for the cleaning plant, the company built an earth dam about 1 mi upstream from the plant. The earth dam impounds 35 million gallons of water and covers an area of 9½ acres. Total watershed feeding the dam is 320 acres. Water is transferred from the lake to a 60,000-gal wooden tank on the hillside above the plant by a Barrett Haentjens 450-gpm pump.



DISK FILTER recovers 28 tph of 28Mx0 coal from fines concentrated in 80-ft thickener. Diaphragm pump lifts thickener underflow to filter feed sump.

MAN-MADE LAKE covering 9½ acres provides fresh water for cleaning plant. Earth dam impounds 35 million gallons of water from watershed of 320 acres.



LOW COST and high capacity are features of new rotary dry-type drill working in tough sandstone in Alabama strip pits. Unit handles 5- to 12-in bits.

Drilling Bottleneck Uncorked by Robbins

Because increasingly tough, thick overburden was creating a production bottleneck, Robbins Coal developed its own rotary, dry-type drill. So impressive were the results that other operators have asked Robbins to build them similar units.

VERSATILITY, high capacity, low cost and mobility are features of a new rotary dry-type overburden drill developed by the Robbins Coal Co., Oneonta, Ala. Operating in thick, tough overburden consisting mostly of sandstones, the units permit stripping operators to work to higher banks and at the same time use explosives more efficiently.

Designed and built especially to meet the conditions at the Robbins mines, the new drill proved so successful that other companies in the Alabama field asked Robbins to build similar units for them. As a result, a separate corporation, the Robbins Machine & Mfg. Co., Inc., was set up to manufacture and market the machine. To date drills have been built for coal companies in Alabama and Arkansas. The drill also has proven successful in the construction field where it is doing the same work as four wagon drills. Three case histories on following pages show how the drill is performing in hard rock.

BIRTH OF THE DRILL

Most of the coal in Alabama that can be recovered by strip mining is thin and nearly all of it lies under hard rock. As the areas under the thinner cover were exhausted, stripping became more and more difficult as the overburden became tougher and thicker. Drilling became a bottleneck and the cost increased. Since the rate of drilling was slow, stripping units could not work at capacity. Thus the overall mining cost increased.

One of the first companies in the area to realize that something had to be done about the drilling problem was Robbins. The company realized that conditions wouldn't improve in the future. In fact, information on hand showed that the rock would become tougher as well as thicker. To prevent drilling costs from going sky high, Robbins became interested in new drilling techniques. A great deal of time and thought were given to the problem of what would be the best type of drill for the thick material.

Before the new drill was developed, blastholes were drilled with a combination of vertical-auger and churn units. The auger drill was used to cut through the surface material and softer rock. The churn drill then was used to complete the holes. But these two machines could not drill enough holes to keep pace with the stripping shovel when the rock became thicker and tougher.

Operating experience showed that the rotary auger had performed at a lower cost than a churn unit. Therefore Robbins felt that some type of

Robbins Experience

COMPANY: Robbins Coal Co., Oneonta, Blount County, Ala.

DRILLING RESULTS: Two men operate one drill on each of three shifts, drilling 9-in holes. Penetration is 12 fpm in shale; 4 fpm in soft sandstone; and 2½ fpm in tough sandstone.

Before dry-type rotary machine was built, drilling was done 7 days per week with one vertical auger and two churn drills. Two men operated the auger on each of two shifts; three men operated two churns on each of the three shifts.

OVERBURDEN: Hard sandstones and shales averaging 75 ft containing 43.5% sandstone and 56.5% shale.

DRILLING AND BLASTING: Blastholes, 9-in in diameter, are drilled vertically on 20-ft centers in rows 25 ft apart. Hughes bits are used. Holes are drilled to within 5 ft of top of coal. Number of holes charged and detonated varies from 15 to 40, depending on pit conditions. Deck loading is practiced with Akremite concentrated in the hard layers. Either 17-MS or 25-MS delays are used between holes and between rows. The length of delay used is selected by the foreman after studying pit conditions. Average charge is 1 lb to 2½ cu yd of the overburden. Holes in the first row are charged at the rate of 1 lb per 2 cu yd so that part of the overburden is thrown into the pit where the stripping shovel does not have to handle it.

MANPOWER: Two men on three shifts, 5 days per week, drill enough overburden to keep ahead of Bucyrus-Erie 18-cu yd shovel working three shifts per day, 7 days per week; Marion 7-cu yd dragline working 2 shifts per day, 5 days per week and a Caterpillar D9 bulldozer working 2 shifts. Combined units move 750,000 cu yd per month.

BENEFITS: A 67% reduction in drilling manpower per week. Cuttings make excellent stemming. Stripping units can work at capacity. Better fragmentation of rock and more efficiency from blasting agent as result of smooth, clean hole.

Calvert & Youngblood Experience

COMPANY: Calvert & Youngblood Coal Co., Inc., Blount County, Ala.

DRILLING RESULTS: In average conditions drill penetrates rock at rate of 4 fpm. Two men operate drill on each of two 7¼-hr shifts, keeping pace with Bucyrus-Erie 550B 19-cu yd shovel working around the clock 6 days per week. Percussion-type drill was operated by two men on three 8-hr shifts but could not keep ahead of stripping shovel.

SEAM: Black Creek, 24 in.

OVERBURDEN: Predominately hard shale with an average of 25% sandstone. Sandstone sometimes makes up 50% of overburden. Average cover is 45 ft.

DRILLING AND BLASTING: Blastholes, 9-in in diameter, are sunk on 27-ft center in rows 25 ft apart. Drill is mounted on International TD 24 unit. Compressed air at 50 psi for removing cuttings is provided by a 600-cfm Gardner-Denver rotary compressor driven by a 180-hp General Motors 6-cylinder diesel engine. Drill stems are 20 ft long. Hughes bits are used. Blastholes are charged at the rate of 1 lb of Akremite to 3 cu yd of overburden. Holes are primed with 50% dynamite and laced with Austin detonating fuse. Between holes, 17-MS delay connectors are used.

MANPOWER: Two men on two 7¼-hr shifts, 5 days per week drill enough overburden to permit 19-cu yd shovel to move 20,000 cu yd per day, 6 days per week.

BENEFITS: Cost of drilling cut 50%. Powder ratio improved to 1 lb to 3 cu yd of overburden from 1 lb to 2¼ cu yd. Drill manpower reduced and overtime pay eliminated. Fuel costs for drill cut 50%. Better fragmentation of rock with larger, smooth hole.

Drummond Experience

COMPANY: Drummond Coal Co., Cullman, Cullman County, Ala.

DRILLING RESULTS: In average shift two men drill, load and shoot 12 blastholes, averaging 25 ft deep, in hard sandstone. Drilling done only one shift, 5 days per week. In softer material, as many as 30 holes have been put down in one shift. When drilling in hard sandstone, fuel consumption is ⅙ as much per foot of drilling as compared to vertical auger-type machine. Hole spacing increased from 15- to 20-ft centers and diameter increased from 6 to 9 in. New bit drills 1,500 ft of hole. Bits, retipped for $20, drill an average of 500 ft of hole.

SEAM: Black Creek, 28 to 33 in.

OVERBURDEN: Medium and hard sandstone, 25 to 30 ft thick.

DRILLING AND BLASTING: Blastholes, 9-in in diameter, are drilled on 20x20-ft squares. Two rows of holes yield 45-ft pit. Holes 20 ft deep are charged with 100 lb of Hercules 188 ammonium nitrate plus a 25-lb primer of Hercules 60% dynamite. A 25- to 28-ft hole is charged with 150 lb of Hercules 188 plus the primer. Holes are connected with Ensign-Bickford or Austin detonating fuse and detonated with instantaneous caps. The drill is mounted on International TD 24 chassis. Hughes bits are used.

MANPOWER: Two men on one shift, 5 days per week, keep pace with the stripping shovel. A Lima 2400 diesel shovel with a 5½-cu yd dipper works 16 hr per day. Unit moves an average of 3,500 cu yd of material in an 8-hr shift.

BENEFITS: Drilling needed only on one shift. Hole spacing increased. Better fragmentation of rock resulting from better distribution of explosives in larger hole. Greater drilling capacity saves manpower. Lower cost per foot of drilling.

LATEST MODEL is package unit with air compressor mounted on front end of tractor. Three hydraulic jacks level the machine for drilling.

HARD SANDSTONE is no problem for the rotary drill at the Drummond Coal Co. where 25 ft is moved to uncover 28-in seam of coal.

rotating machine would be best for the job of drilling the thicker rock. Management also recognized that the new machine also must be able to travel easily over rough terrain in the stripping area and be designed so that it could be moved easily from pit to pit. And it must be able to drill large holes. The company believed that an oilwell-type cutting bit would do the best job. Low cost also was important since the company was mining only 25 in of coal and heavy capital expenditures were not desirable. With these basic requirements established, Robbins decided to design and build a machine in their own shop.

To provide a frame for the drill, the company remodeled the chassis of a Caterpillar D6 tractor, which also provided enough weight to give good pressure and stability. Suitable hydraulic equipment was added to provide for leveling and hydraulic feed. To remove cuttings from the drill hole, the company decided to rely on compressed air. The first Robbins machine drilled a 9-in blasthole and provided a 15-ft steel change.

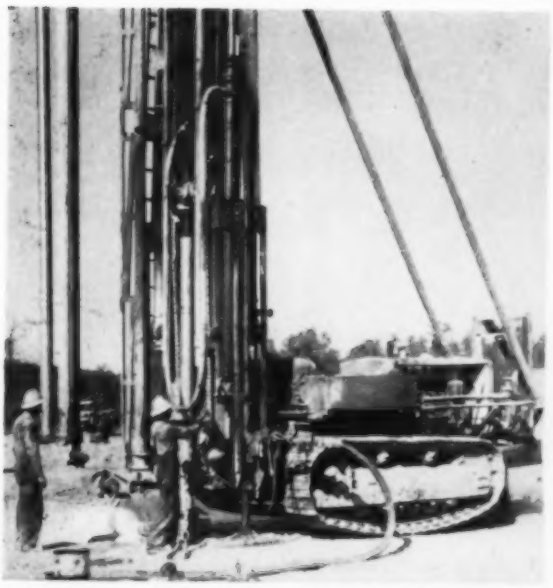
Robbins completed the first drill in 1952. The unit lived up to the company's expectations and was able to drill the overburden fast and economically. However, as men in the pit became acquainted with the new drill and method of drilling they saw that certain improvements could be made. As a result, modifications were made as worthwhile ideas were offered. Later models of the drill, mounted on a Caterpillar D8 tractor, drill 5- to 12-in holes.

Other strip mine operators were impressed with the performance of the Robbins drill and asked the company to make similar machines for them. After working out the details for each of the other operators, the drills were built. If a purchaser had some equipment available that could be used in building the drill, Robbins designed the unit so that the available components could be used. Thus the overall cost of the drill was kept to a minimum. In some instances a tractor chassis was available, in others a diesel motor for driving the air compressor was on hand. If the components met the specifications for the drill, they were used. In all cases the working section of the drill, including the hydraulic system, leveling jacks, drill-rotation gear box, drill feed and mast were designed and built by Robbins. All of the assembly work was done at the Robbins shop in Oneonta.

TODAY'S DESIGN

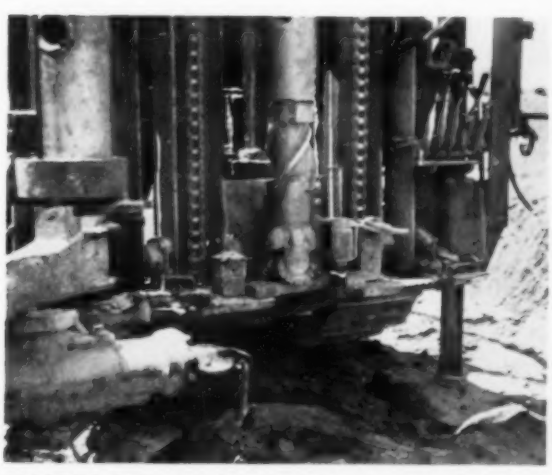
Today's machine is designed to drill holes from 5 to 12 in in diameter. Hydraulic pressure can be varied to meet the varying toughness of rock. Drill stems are made in lengths from 10 to 25 ft to meet the needs of the individual operation and the terrain over which the drill must travel. All machines are designed so that the mast can be laid down while the unit is hauled to a new pit. Since the machines operate in one or more pits and frequent moves must be made, the drill is designed so that it can be broken down and made ready for moving in 4 or 5 min. Two 8-in hydraulic jacks are used to lower the mast to the horizontal position.

Drill pressure is applied by two 8-in hydraulic jacks and can be as high as 2,000 psi. Leveling also is done with three 8-in hydraulic jacks, two of which are located at the front and one at the rear of the machine. The air compressor that removes the



SEPARATE COMPRESSOR provides compressed air for drill at Robbins. Men are withdrawing steel from hole.

ROBBINS OVERBURDEN includes 43.5% sandstone and 56.5% hard shale. Drilling rate is 12 fpm in soft shale.



CLOSEUP shows drill bit, dust deflector, chains that apply down pressure and controls for operating drill.

OPTIONAL DESIGN at Drummond Coal has air compressor and compressor motor mounted separately.

drill cuttings usually is mounted at the rear of the machine. However, some drills have been built so that a separate wagon-mounted air compressor can be used to supply compressed air. The tractor motor is used to drive the hydraulic pump through the power take-off and also to tram the drill.

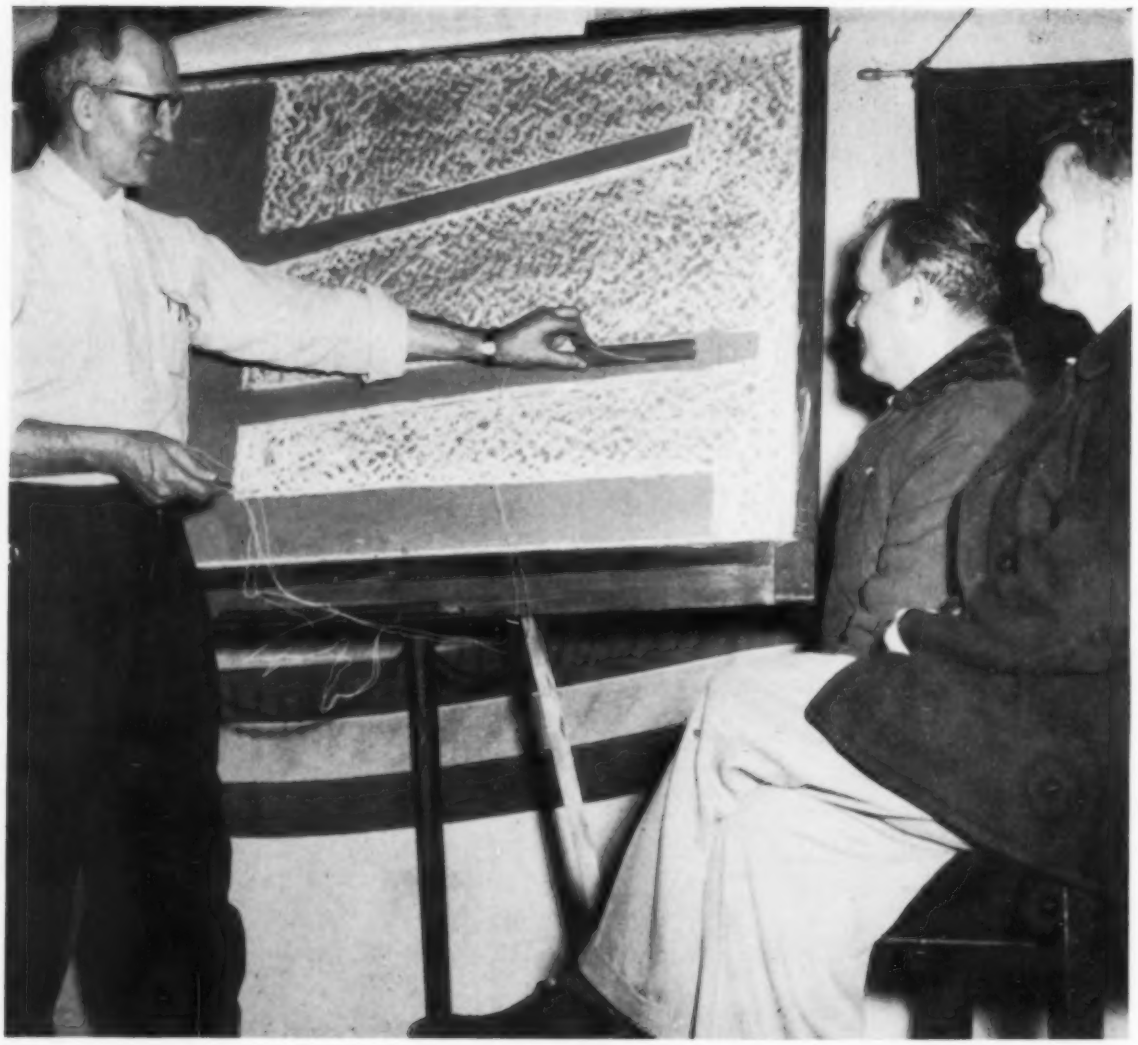
A revolving rack which holds five sections of drill stem makes steel changes easy. The rack can be rotated by hand to position the steel over the hole and the rack support in turn can be moved to or from the hole so the steel can be positioned properly.

Power for the drill rotation comes from the rear power take-off of the tractor through a Fuller transmission having four speeds forward and one reverse. Through a chain drive, the transmission powers a square shaft running the height of the drill mast. The square shaft drives a floating gear box which rotates the drill steel at speeds between 25 and 120 rpm.

Down pressure as high as 30 tons on the drill bit is obtained by two 8-in hydraulic cylinders operating from a 70-gpm hydraulic two-stage pump driven by the front power take-off of the tractor. These hydraulic cylinders operate a rack and pinion that raise and lower the drill stem. Three 8-in hydraulic jacks level the tractor for drilling. The 225-gal hydraulic system has a tank capacity of 150 gal. Dirt is kept out of the hydraulic system by a disk-type filter in the system itself and a metal screen in the hydraulic tank.

Total weight of the Robbins unit is about 24 tons, including ballast and oil. When a compressor is mounted on the front of the tractor, the need for additional ballast is eliminated.

A separate 600-cfm wagon-mounted air compressor supplies air for removing drill cuttings at Robbins.



PROPER METHOD for blasting is demonstrated by J. B. Yanity, Sr., USBM, during an accident prevention class at Isabella mine, Weirton Steel Co., W. Va. Instructing in safe mining practices and creating a spirit of safety consciousness among the total mine group are basic to . . .

Educating for Safety

USBM pushes completion of its 100% safety training program in W. Pa. District No. 5. By individualizing safety, such programs have taken safety down to the "grass-roots" level and have brought a new dimension to accident prevention.

PREPARATIONS are being made to complete 100% accident prevention training for the employees and officials of all coal mines in UMWA District No. 5. Over half of this district has already received the training.

Although the largest district in Pennsylvania, District No. 5 will not be the first district in the Nation to achieve 100% safety training. This distinction goes to District No. 4—also in Pennsylvania—where the total mine and management force of 15,000 has already taken USBM's course in accident prevention.

Good results are being obtained in reducing accidents from USBM accident prevention training. Monthly records kept on man-hour exposure and lost-time accidents show improvements from 20 to 60% at most mines. The few mines which have not shown improvement in eliminating accidents have been handicapped by personnel layoffs, new and untrained personnel, and changes in mining systems.

USBM accident prevention training has contributed greatly to promoting safety for coal miners and officials. The training has been a vital supplement to state and federal mine safety laws which are not enough to promote safety as it should be.

Safety starts with every individual connected with coal mining, from the president of the company to the man at the working face, states J. B. Yanity, Sr., USBM accident prevention instructor. "Safety is created by having good labor relations, friendly cooperation between employees and officials, and by training every man to think safety to a point where every worker should be his own safety director."

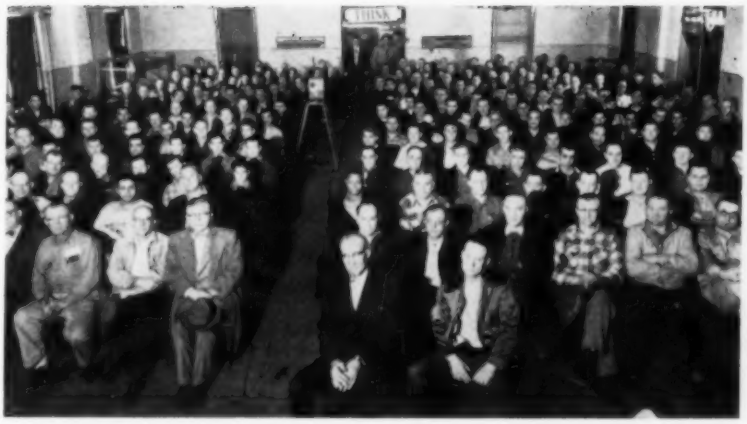
Experience proves that unless 100% of the employees and officials are trained at a mine, improvements in accident reduction are not as good as where the training is 100%.

Mr. Yanity confirms that a fixed group is careless and takes chances. "One would believe that the careless group would be the inexperienced persons. However, this is not always the case, as many experienced employees become so familiar with the job they feel confident that accidents cannot happen to them. Therefore, they often take chances less experienced men hesitate to take. They keep on taking chances until the law of averages catches up with them, an accident occurs, and then it is too late."

Persons should be trained not to take chances, because if they take a chance and an accident occurs, there is not a second chance. **It is too late.**

Most of the employees and officials know how to do their jobs; the trouble is that the temptation is always there to take short cuts. Almost any individual, at times, will be under emotional strain or conflict which may make him "accident prone" and an injury may result.

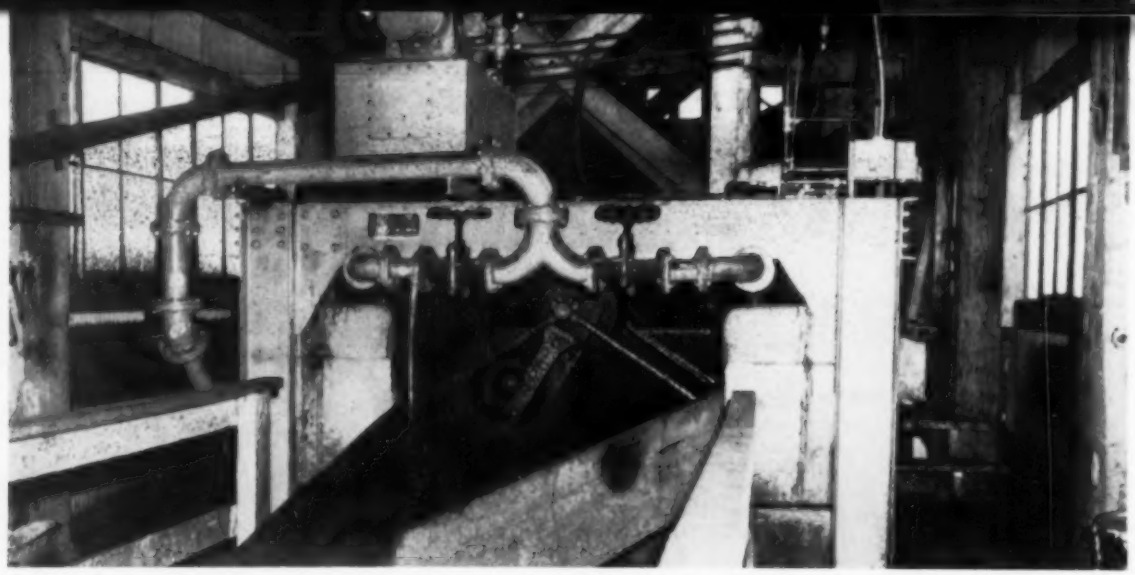
Some people find solutions to their problems, and defend themselves against their emotional conflicts, but most people cannot. Thus the accident training prevention course is a great help in stimulating workers to think in terms of safety.



TOTAL mine management and labor forces must be geared to think in terms of safety. Here, the second shift of employees attend accident prevention class at Isabella mine, Weirton Steel Co., W. Va.

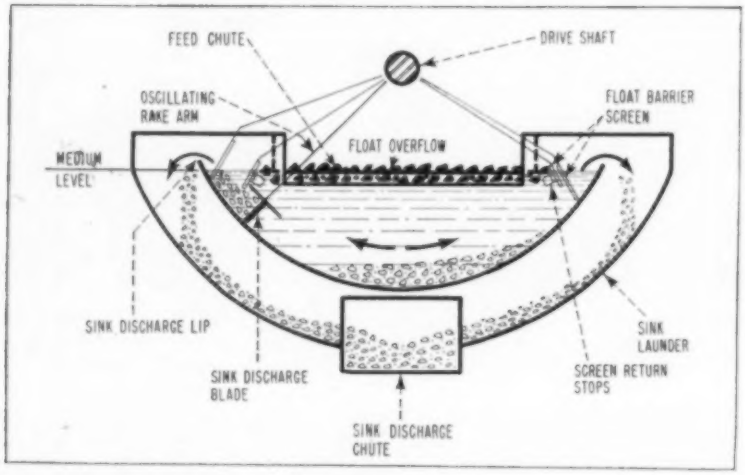
SAFETY STARTS with every individual connected with the coal mine. Even the participation of wives and children is encouraged, as shown above at a safety day celebration, Isabella mine, Weirton Steel Co., W. Va.

JAMES C. GRAY, U. S. Steel Corp., addresses mine employees and officials at Carmichaels, Pa., during the presentation of a 100% certificate to William Hynes, president, UMWA District No. 4—the first in the Nation to complete 100% training in all of its mines.

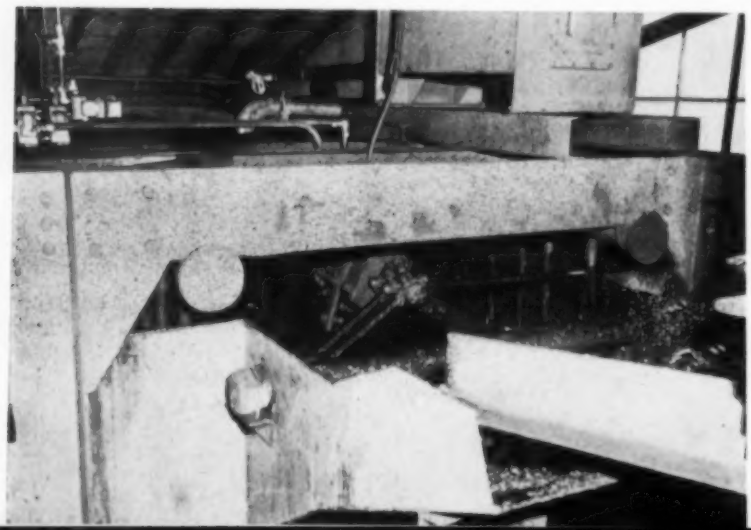


HEAVY-MEDIA VESSEL in anthracite plant cleans wide range of sizes formerly requiring several units.

Cleaning Anthracite at Lower Cost



SECTIONAL VIEW (above) shows operating features and view from feed side of vessel (below) shows media-return manifold discharging into bath.



Live Oak Coal Co. simplifies cleaning by feeding wide range of sizes to single heavy-media vessel.

This is Live Oak's way of winning a new lease on today's highly competitive anthracite business.

CONFRONTED by the economic facts of life in the anthracite industry, as they affected the smaller, independent producer a year ago, the owners of Laychock Live Oak Coal Co., Minersville, Pa., decided against leaving the business and instead modernized their cleaning operations to insure their place in the market. Accordingly, an investment in a new type of heavy-media cleaning unit was made, with the immediate results that higher yield, better quality and more efficient handling of coal in the plant circuits added up to a new lease on life for the company.

Peter Laychock Sr. is principal owner of the company, with the primary duty of overseeing the deep-mining operations from which the

plant receives its raw coal. Mr. Laychock's two sons, John and Peter, are in charge at the plant, John having direct supervision of operations and Peter handling coal sales.

In discussing their reasons for modernizing, the Laychocks point out that raw coal at the plant hopper represents an "investment" equal to the total cost of mining the coal and hauling it to the plant. After due consideration of all factors, a decision was made to concentrate on increasing cleaning efficiency since this course of action promised more immediate results.

ONE CLEANER REPLACES MULTIPLE UNITS

Replacement of several classifier-type cleaners with a single Wilmot OCC heavy-media vessel is the major step in modernizing the Live Oak plant. This resulted in immediate simplification of the plant circuits through the elimination of multiple-deck raw-coal shakers, formerly required to split the feed into relatively narrow size fractions. The new cleaner is capable of handling a wider range of sizes, from 2⅝ in down to 3/16 in, which includes all sizes from stove through rice.

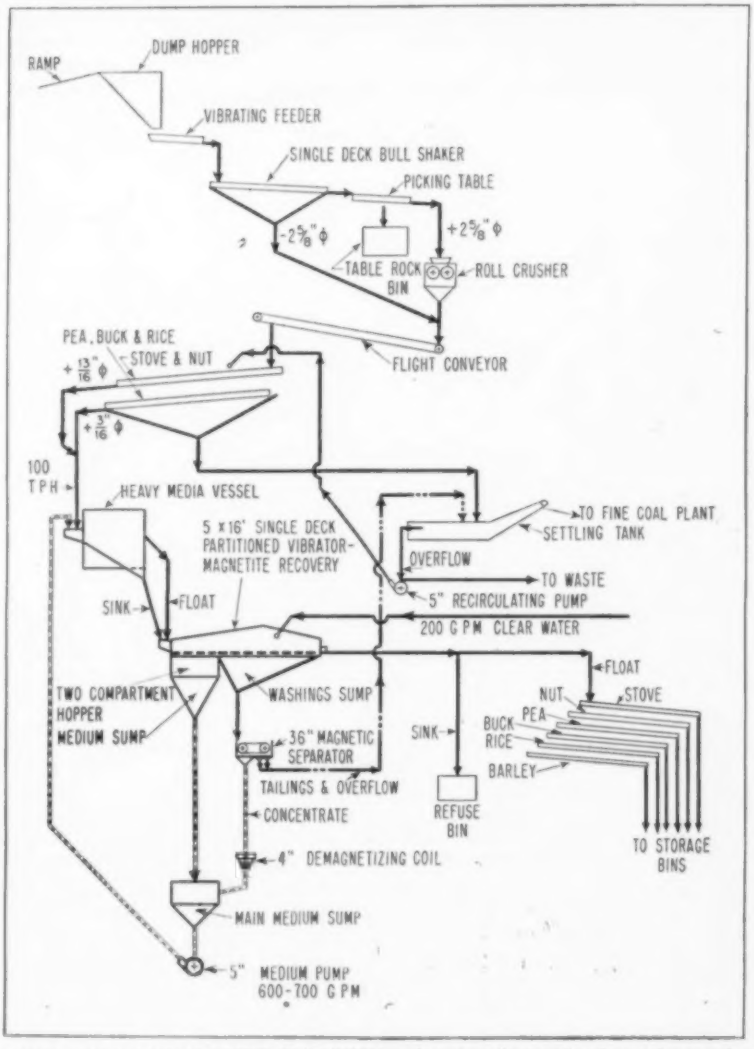
Savings show up in a number of places. For example, numerous chutes and screens, formerly necessary for transporting coal and refuse from the separate cleaners and in dewatering service, have been removed. Maintenance costs for all these units is thereby eliminated. Labor requirements also are sharply reduced, including the labor involved in both plant operation and maintenance. Benefits like these place the company in a better competitive position.

HOW THE NEW VESSEL OPERATES

The Wilmot OCC vessel at Live Oak, rated to handle 100 tph feed, is essentially a double-hulled tank in which the inner hull contains the separating bath and the outer serves as a launder to carry the sink material to the sink discharge chute. The only major moving part is a rake which sweeps back and forth through the bath to lift sink material from the bottom of the bath toward the sink-discharge lips on either side (see accompanying cross section).

The rake is powered by an automatically-reversing hydraulic cylinder provided with manual controls for adjusting the number of strokes per min. A rubber flap is attached to the bottom of the rake to close the gap be-

HEAVY-MEDIA EQUIPMENT is installed in the upper level of the larger structure in the background. Settling tank concentrates feed for wet tables.



SIMPLIFIED ANTHRACITE CLEANING, using one cleaner in place of several, reduces overall costs for Laychock Live Oak Coal Co.

SINGLE MAGNETIC SEPARATOR densifies magnetite washed from coal and refuse on partitioned vibrator.

VIBRATING FEEDER removes coal from bottom of dump hopper and discharges onto bull shaker and picking table.

Live Oak's Heavy-Media Performance at 1.70 Sp Gr

FEED TO VESSEL

Mesh	Size	Percent Wt of Size	Float % Wt	Float % Ash	Sink % Wt	Sink % Ash	% Ash
3¼ x 2⁷/₁₆	Egg	5.2	69.3	10.2	30.7	58.5	25.1
2⁷/₁₆ x 1⅝	Stove	26.8					
1⅝ x ¹³/₁₆	Nut	24.0	69.6	11.1	30.4	63.7	27.1
¹³/₁₆ x ⅜	Pea	10.3	75.2	11.0	24.8	63.7	24.1
⅜ x ⅝	Buck	17.4	74.1	9.8	25.9	59.7	22.7
⅝ x ⅜	Rice	11.2	77.0	11.3	23.0	60.9	22.7
⅜ x ³/₁₆	Barley	5.1	75.9	11.0	24.1	59.7	22.8
Total		100.0	72.0		28.0		24.7

RECOVERED COAL

Mesh	Size	Percent Wt of Size	Float % Wt	Float % Ash	Sink % Wt	Sink % Ash	% Ash
3¼ x 2⁷/₁₆	Egg	5.6	100.0	10.3	....	....	10.3
2⁷/₁₆ x 1⅝	Stove	27.5					
1⅝ x ¹³/₁₆	Nut	25.9	99.7	10.5	0.3	31.6	10.6
¹³/₁₆ x ⅜	Pea	10.7	99.6	10.0	0.4	33.6	10.1
⅜ x ⅝	Buck	16.8	99.2	10.2	0.8	37.6	10.4
⅝ x ⅜	Rice	10.2	96.6	10.3	3.4	44.8	11.8
⅜ x ³/₁₆	Barley	3.3	95.4	10.4	4.6	47.3	12.1
Total		100.0	99.25		0.75		10.6

REFUSE

Mesh	Size	Percent Wt of Size	Float % Wt	Float % Ash	Sink % Wt	Sink % Ash	% Ash
3¼ x 2⁷/₁₆	Egg	9.2	....	....	100.0	60.3	60.3
2⁷/₁₆ x 1⅝	Stove	41.7					
1⅝ x ¹³/₁₆	Nut	23.6	0.3	25.7	99.7	61.7	61.6
¹³/₁₆ x ⅜	Pea	8.6	0.2	21.3	99.8	62.0	61.9
⅜ x ⅝	Buck	9.4	0.2	15.5	99.8	64.0	63.9
⅝ x ⅜	Rice	4.6	0.9	14.0	99.1	63.8	63.4
⅜ x ³/₁₆	Barley	2.9	1.1	14.5	98.9	65.4	64.8
Total		100.0	0.18		99.82		61.4

Magnetite loss: 0.24 lb per ton of feed.

tween the rake and the bottom and sides of the tank.

Feed enters the vessel at the surface of the bath over a chute from the primary shaker. Float material moves across the surface of the bath, perpendicular to the direction of rake travel, to discharge over the float weir. Sink material drops through the bath to the bottom of the vessel to be removed by the rake.

The magnetite recirculation and reclamation system includes a 5x16-ft partitioned vibrating screen, a two-compartment sump to receive fast-draining medium, a single sump to receive washings from the vibrating screen, a medium sump, magnetic separating equipment and a medium pump.

The vibrating screen is partitioned longitudinally to provide channels for clean coal and refuse from the vessel. Fast-draining medium underflowing the lead end of the screen is sluiced directly to the main medium sump to be returned to the vessel without further treatment. Fresh-water sprays over the discharge portion of the vibrator use 200 gpm to wash any remaining magnetite into the second sump. This material is fed to a 36-in Memco magnetic separator which collects and concentrates the magnetite in the washings. The concentrated medium then is passed through a demagnetizing coil and deposited in the main medium sump.

Densified medium from the main sump is returned to the vessel by a 5-in Barrett Haentjens pump. The makeup medium is fed into the vessel through two six-nozzle manifolds, one on each side above the bath. The

amount of medium entering the bath is throttled by a pair of Flex Valve pinch valves at the vessel, as shown in an accompanying illustration. A small portion of this makeup medium is introduced over the feed chute to the vessel as push water to move the feed into the vessel.

SIMPLIFYING PLANT CIRCUITS

The Live Oak plant grew over the years through the addition of cleaning units to keep pace with increasing demand for anthracite during World War II and the post-war period. Also, a wet-table plant was added as a separate facility when the market for the finer Buckwheat sizes broadened. One of the major goals in modernizing was to make use of existing structures and equipment in preference to going all out on an entirely new plant.

The cleaning plant now consists of three distinct structures for (1) hand picking and primary crushing of the raw coal, (2) heavy-media cleaning and final sizing of the coarser sizes and (3) tabling and storage of the fine coal.

Raw coal is trucked from the mine to the plant-feed hopper, then discharged from the bottom of the hopper by a vibrating feeder onto the single-deck bull shaker. The plus 2⅝-in material is scalped for hand picking, crushed to minus 2⅝ in and combined with the under product of the bull shaker at the plant-feed conveyor. There is no longer a worthwhile market for any size larger than Stove coal (2⅞₀x1⅝); therefore, the owners of Live Oak eliminate at the outset the problems of handling and storing the lump sizes by crushing the raw coal to minus 2⅝ in.

The plant-feed conveyor discharges in the heavy-media plant onto a double-deck shaking screen, jacketed with 1³⁄₁₆- and ³⁄₁₆-in round-hole screens. Overproducts of both decks are combined to feed the heavy-media vessel, and the minus ³⁄₁₆-in underproduct is sluiced directly to a settling tank outside the plant. Tailings and overflow from the magnetic separator also are sluiced to this settling tank which provides feed for the tabling plant.

Clean coal discharged from the magnetite-recovery vibrator is chuted directly to the six-deck coarse-coal sizing shakers which separate the Stove, Nut, Pea, Buckwheat, Rice and Barley sizes. These sizes are stored in elevated truck-loading bins in the main structure. Washed refuse from the vibrator is conveyed to an elevated bin for disposal in trucks.

Raw fines are removed from the settling tank by a drag conveyor and transported to a vibrator in the table plant. Three Deister SuperDuty Diagonal Deck tables recover the Nos. 4 and 5 coal. Overflow water from the settling tank is returned to the heavy-media plant through sprays over the raw-coal shakers.

CLEAN COAL is stored on ground for loading during peak demand periods. Portable conveyors—one of them mounted on a truck chassis (below)—provide flexibility in retrieving coal from any of the stockpiles.

STORING RAW AND CLEAN COAL

A stockpile of raw coal, sufficient to provide three days' operation of the plant, is stored on the ground near the feed hopper. Portable, gasoline-powered elevating conveyors and a tractor mounted over-shot loader are available for retrieving this coal and loading it into trucks. The Laychocks operate their own fleet of five 10-ton trucks for hauling coal from the mine.

The coarse sizes cleaned in the heavy-media plant are stored in truck bins, as mentioned. Fine coal from the table plant is conveyed to ground storage, to be recovered as needed by portable conveyors. This fine coal usually is sold in carload lots for shipment on the Pennsylvania or Reading railroads. Ground storage, therefore, is most economical for these finer sizes which are transported by truck to the loading ramps.

The Coal Commentator

All of Them

If they don't run, they can't produce!

Simple, yet more and more one of the coal industry's main concerns.

To elucidate, machines are taking over a larger and larger share of the coal-producing job. At the same time, they are growing in size, capacity, and also cost, thereby multiplying the penalty when one goes out of service. In short, good maintenance is more critical than ever before, and if the statements of a fair number of operating men are an indication, the industry has a considerable way to go.

Maintenance probably is better at many operations than the men who are running them will let on. Probably, also, it could be better at the majority. Perfection doubtless is too much to expect, but a close approach can be achieved by following basic principles, even though the details will vary from mine to mine. **For those basic maintenance principles, and for some of the latest in techniques, your commentator recommends a review of the material in the 1956 Coal Age Mining Guidebook, issued in July. If maintenance is troubling you, have a look.**

Good Reasons

One hundred percent accident-prevention training and presentation of Joseph A. Holmes safety awards are the best reasons in the world for having a picnic. So the Mining Dept. of the Colorado Fuel & Iron Corp. was only doing what comes naturally in scheduling its 1956 event for Sept. 15 at Monument Lake Park, one of Colorado's more breathtaking mountain beauty spots. Your commentator here and now expresses his gratitude for being honored with an invitation, not only because of the thought behind it but also because it provides a golden opportunity for pointing out once again that real safety can be achieved, and that 100% training is a big help in that direction. The Colorado Fuel & Iron record, as well as the records of many others, provides incontrovertible proof.

Germany, Too

The United States coal industry has its problems, some tough and some of long standing. But in many ways it might be considered fortunate in comparison with the industry in many other countries, particularly those that are now importing heavily from the U. S. Take Germany for example, and take particularly two items appearing in the *German Economic and Foreign Trade News* of July 31:

"With the 48-hr week now giving away to a shorter work week in Germany, problems like those encountered by the coal industry are typical. The loss of 3 hr per week represents an annual reduction of 8,800,000 tons in coal mined. To compensate for this loss ways are being sought to increase production per man from the present 1.60 tons per shift to 1.71, or imports will have to take up the slack. Higher coal prices are expected in any case."

"Germany's coal industry expects to invest over $700,000,000 in the next 10 yr to increase production 30,000,000 tons to a total of 180,000,000." This works out to a rate of over $23 per ton of annual capacity, compared to the top of $8 to $10 in the U. S.

It can be assumed that Germany will make a valiant attempt to create this new capacity and raise its output per man. But it cannot be done overnight and meanwhile the demand for energy is rising steadily. **So here, as in other continental countries, U. S. producers have an opportunity to build a lasting market through quality, low cost and low ocean freights."**

Inner Man—and Outer

Anthracite fans, after a long series of years of declining production, have something to cheer about in 1956. Production was up 7.9% as of Sept. 1, with good prospects for continuing at that level even if a further rise is not experienced. In addition, they continued to get a lift from news of new recruits, and of old timers that still find anthracite the best.

Two old timers are establishments in Brooklyn catering to the inner man. Gage & Tollner, established in 1879, specialize in grilling over anthracite, using 12 tons of egg a month. A Gage & Tollner steak is a real adventure in good eating. A short distance away, Joe's restaurant, started in 1909, bakes with anthracite to the tune of 25 tons per month. As with the steaks, the bread is truly special.

New additions to the anthracite ranks include one that might be classed as catering to the outer man. It is a new development of 200 houses at Mountaintop, in Luzerne County, Pennsylvania—all designed for stoker-fired anthracite. So, whether it is warming the inner man, or the outer, anthracite still is definitely in the picture.

Art in Coal

The coal industries of the United States (anthracite division) and France furnish two of the latest of the artistic and decorative possibilities of coal. In anthracite, a New York jewelry designer, Le Beau, has completed a line of distinctive handcrafted anthracite jewelry.

Coal in paintings is the contribution from France. Under the title of "Mining and the Arts Through the Ages," Charbonnages de France offers reproductions in bound form of representative paintings in the exhibit held in connection with the International Mining Congress, held in Paris last year under the sponsorship of La Societe de L'Industriale Minerale. The price is $14, postage and packing included. Order from M. N. Barbier, c/o French Mining Equipment, 35 Wisconsin Circle, Chevy Chase, Md.

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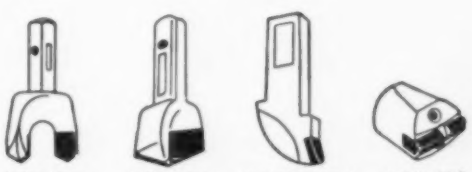

FOREMEN'S FORUM

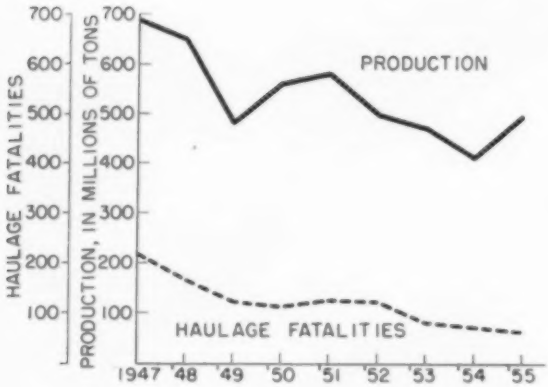

FIG. 1—Haulage fatalities decline.

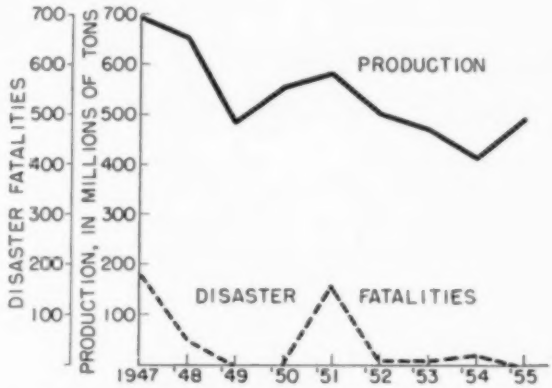

FIG. 2—Fatalities resulting from disasters.

Line Supervisors . . . Key Men in Safety

The immediate supervisor of men in working places must enforce established safety rules.

Nobody else with similar authority is so close to the scene of action.

THE MONTH OF OCTOBER has special significance with respect to mine safety for these three reasons:

1. The attention of the Nation turns to Chicago where the greatest safety convocation on earth, the National Safety Congress, assembles to study all phases of home, highway and industrial safety. A prominent feature of the proceedings will be the meetings of the Coal Mining Section. Safety representatives of the union, operators and state and federal agencies confer with the common purpose of finding ways to make mining safer.

2. October 1 marks the beginning of the final quarter of the year, providing a new point of departure for increased emphasis on safety. Top-level safety performance in the final quarter can convert a mediocre record into a good one, and remember, a good safety record means that lives have been saved.

3. Cooler weather arrives in October, bringing with it the special problem of dryness underground. The hazards of dry coal dust become an immediate problem, and we recall a number of vicious disasters occurring in these final months of other years.

This is a natural time, therefore, to discuss again some trends in mine safety and what supervisors can do to support the favorable ones and turn back the unfavorable. After all, safety is the most important responsibility facing any coal-mining official.

The National Safety Congress will be held late this month. We invite you now to read the full report of the Coal Mining Section proceedings which will be published in the December issue of *Coal Age*.

Turning to the opportunities that exist for increasing safety still further, let's go to the record to determine where we stand now. This should make it possible to pinpoint the areas where increased effort in safety promotion is immediately required.

HAULAGE SAFETY

Fig. 1 shows trends in coal production (anthracite and bituminous, combined) and total haulage fatalities in recent years. Note that regardless of peaks and valleys in the production curve the number of haulage fatalities shows commendable reduction.

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350,000 cm	22487	3.0 lbs.
500,000 cm	22488	4.75 lbs.
750,000 cm	22489	5.75 lbs.
1,000,000 cm	22490	6.75 lbs.

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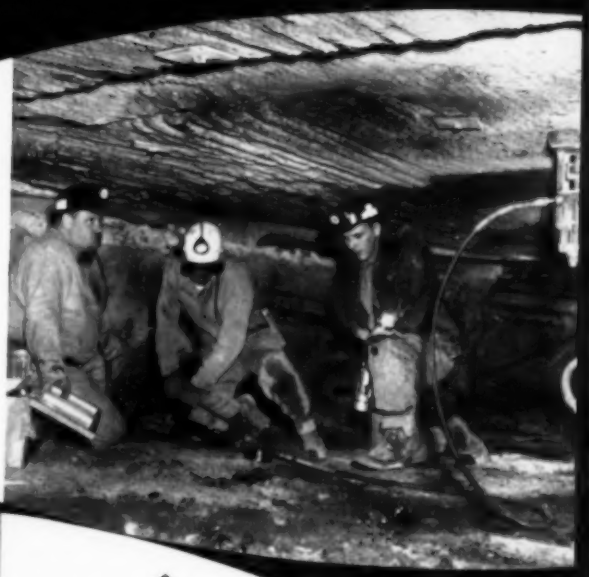

O-B representative conducts roof bolt "pull test" with hydraulic ram

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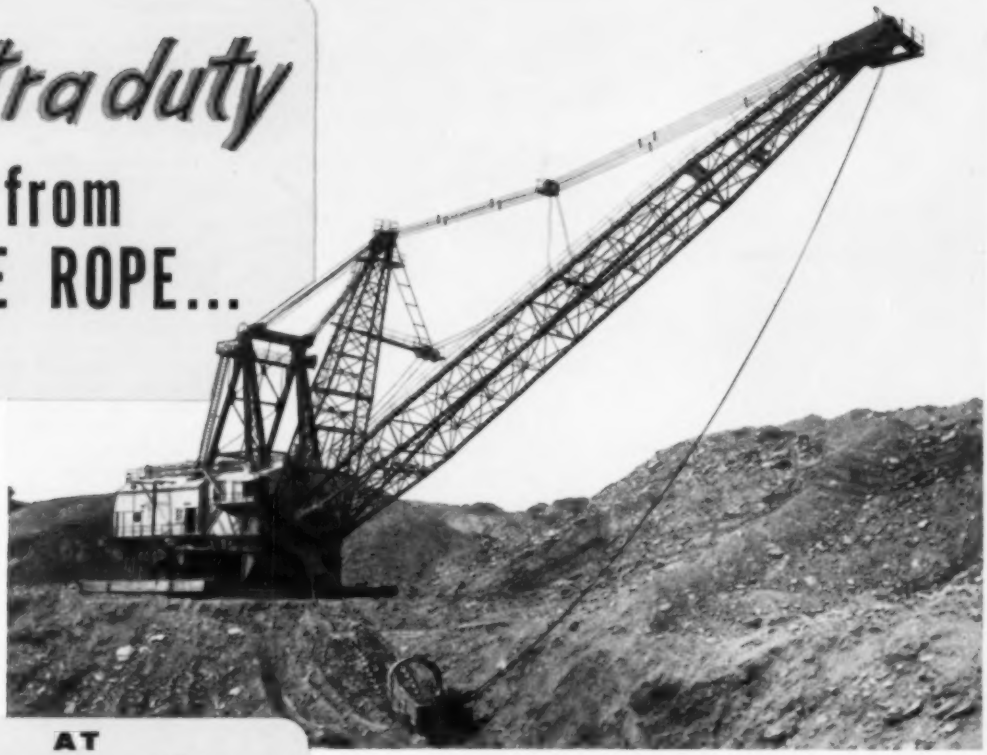
Extra duty from WIRE ROPE... AT Harmattan Mine



Extra duty — extra hours. That's what G. W. Wilson, Superintendent of Fairview Collieries Corp. reports for Yellow Strand Wire Rope on the dragline at the Harmattan Mine, Danville, Illinois.

Where other makes of wire rope have averaged 600 hours on the dragline, Yellow Strand averages 735 hours. The present set of rope is lasting more than 900 hours.

Records such as this are not uncommon for Yellow Strand in the coal fields. It's precision-made to the highest quality standards — built to take the tough jobs and give extra duty.

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American Logging Tool Corporation is a subsidiary of Broderick & Bascom Rope Co.

FIG. 3—Production up . . . roof-fall fatalities up.

How has this improvement been achieved? There are a number of reasons, not the least of which are training programs directed specifically to haulage employees and close supervision. Just as important, however, is the fact that the haulage operation is amenable to mechanical improvements that result in greater safety. For example, enclosed cabs greatly increase safety for operators. Automatic couplings for mine cars make it unnecessary for brakemen to get between cars. Block-signal systems and automatic switches have reduced collision hazards. Fewer derailments occur on modern trackage and roadbeds.

Rigid rules governing shuttle-car operations also have been helpful. And the expanding use of conveyor transportation has removed haulage crews from many close-clearance openings.

Continued improvement in haulage safety will result from increased emphasis on tested methods like these, if supervisors will take strong measures to control the careless haste among haulage employees which could negate all other efforts.

DISASTER FATALITIES

As shown in Fig. 2, there is no pattern in the rate of occurrence of disaster fatalities. Given certain unholy conditions, a mishap will occur, and if five men lose their lives we define the accident as a disaster. The terrible truth is that scores of men may be involved in any of these mishaps, and sometimes are. Even more sobering is the knowledge that in the 2⅛ yr ending Dec. 31, 1955, 120 fires in the bituminous mines of the U. S. were reported to the Bureau of Mines. Each of these might have been the threshold to a disaster, and nobody knows how many such incidents were unreported.

Elimination of the conditions that lead to such mishaps is the mine supervisor's job, primarily, and it is an hour-by-hour responsibility. Top management can provide fire-fighting equipment, but it is the supervisor's duty to see that it is maintained in effective operating condition. Mining engineers can work out roof-support plans, but supervisors must enforce them. Inspectors may deplore dust accumulations, but supervisors must see that they are loaded out or otherwise neutralized.

ROOF-FALL PROBLEM

Year after year, roof falls are the No. 1 Killer in coal mines. This type of accident assumes greater relative seriousness in recent years. While haulage fatalities are on a steady downward trend and more control over gas and dust hazards is being achieved, injuries and fatalities from falls of roof and coal seem to defy prevention. Of course, fewer victims are claimed now than was the case 10 yr ago, but still a rise in production is accompanied by a rise in roof-fall fatalities, as shown in Fig. 3. (Our charts are based on tonnage to relate fatalities to the activity within the industry. It would be difficult, if not impossible, to determine exposure time of haulage employees to the special hazards within 25 ft of the face, say, or the exposure time of face workers to haulage hazards.)

From all indications, intensive campaigns against the roof-fall evil can be effective. In relating experience in Pennsylvania, Lewis E. Evans, deputy secretary, Department of Mines and Mineral Industries, cites results of the 1955 campaign as follows:

In the 6-yr period, 1949-54, tons per roof-fall fatality averaged 2,028,257. In the first 8 mo of 1955, with the campaign in full force, the rate was one roof-fall fatality for every 3,479,132 tons.

Each roof-fall injury or fatality was thoroughly investigated and the reports brought to light these facts:

One-third of the accidents occurred in the single hour from 1:00 to 2:00 P. M., leading observers to consider whether men and officials experience a let-down at this time of day. Two-thirds of all roof-fall fatalities occurred in high coal which contributes about 60% of Pennsylvania's bituminous production. Roof-fall fatalities in mines employing from 5 to 15 men accounted for 25% of the total, although these mines contribute only about 5% of total production. More than 80% of all roof-fall fatalities occur in the immediate face area.

Mr. Evans' statistics are compiled only after reading numerous reports from investigators. As far as the individual face foreman is concerned, he may think that the accident which occurred in his section is highly unusual, but anyone who reads numerous reports of roof-fall accidents sees the same words, time after time. Safety posts were not set. . . . Roof-support plans were not followed . . . Last support was 18 ft from face. . . .

Perhaps greater progress in roof safety could be made if more foremen had frequent opportunity to read USBM publications on the causes of actual roof-fall accidents. Superintendents might rout these publications among their foremen.

THE FOREMAN'S ROLE

The sincere interest of top management and government officials is necessary to give impetus to safety promotion. Adequate training of mineworkers also is indispensable. But the immediate supervisor of the men is the key figure. The responsibility of producing accident-free coal rests most heavily upon him, and the authority to enforce safety rules in the working places resides in him. Nobody else with authority is so close to the scene of action.

The upshot is that the line supervisor must be convinced himself that safety for its own sake is worthwhile. Then, the observance of minimum roof-support standards—in every working place, every day—must become an obsession with him.

This is a good time to make a rededication to sincere safety effort since October is a month of many mine-safety benchmarks. It occurs to us that if ever a National Mine Safety Month is proclaimed it should be in October.

Voice of the People

NOVEMBER 6 is E-Day! Don't fail to vote. How you vote is your personal affair. Study the issues and the candidates, then exercise your most precious American right . . . pick your man and vote for him.

Your vote does count, and remember, don't criticize if you don't vote.

McCARTHY AUGER DRILLS

- 60 TO 75 TONS PER HOUR
- SELF-MOVING FROM HOLE TO HOLE
- 2- OR 3-MAN CREW
- MINES HIGH-QUALITY COAL

● Twelve models of McCarthy Coal Recovery Drills auger-mine bonus coal at THE LOWEST operating cost per ton. They operate easily in narrow strip pits. Hydraulic controls simplify alignment, augering and changing position. Let us recommend the right cost-saving model for your property. Write for Bulletin M-101 and M-102.

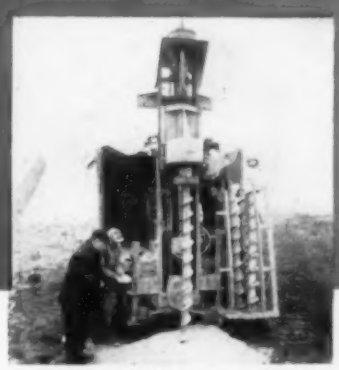
SELF-PROPELLED

Horizontal Earth and Rock Boring Auger Drills 150 ft. Drilling Depth

● The self-propelled unit permits speedy, economical blast-hole drilling from hole to hole. It takes just a few seconds to disengage the power unit from the auger drive shaft, change position, and begin drilling again. The unit is easily attached to the McCarthy truck-mounted earth and rock boring drills now in use.

TRUCK-MOUNTED

● Truck-mounted horizontal drills are highly versatile. The drilling unit mounts lengthwise or crosswise on the truck bed for spotting hole locations faster. Drilling height from the ground ranges from 4½ to 7 ft. Four separately operated levelling jacks permit close alignment. Write for Bulletin M-105.



HEAVY-DUTY VERTICAL

Model 106-24—World's Fastest Heavy-Duty Vertical Auger Drill

● Bores vertical blast holes faster than any other auger drill. New gear reduction permits slower auger rotation for drilling larger holes deeper in harder rock formations. Augers 8" and 9" dia. drill holes to depths of 125 ft. for use of new type explosives. Controls can be placed at rear and auger racks can be furnished if desired. Write for Bulletin M-100.

FINGER-TIP CONTROL

Gives Desired Rotating Speed Of Auger

HEAVY RUGGED

HYDRAULIC FEED

Provides Any Speed Up To 6 Feet Per Minute Horizontal Feed Of Drill

POWERFUL

MANUFACTURED BY

THE SALEM TOOL COMPANY

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SALEM

OPERATING IDEAS

MIXING is easy. Colloidal graphite is hand mixed in 1 to 7 ration with mineral spirits. No agitation is necessary.

APPLICATION is by means of ordinary paint-spray gun while elevator is in motion.

Colloidal Graphite Lubricates Bucket Elevator

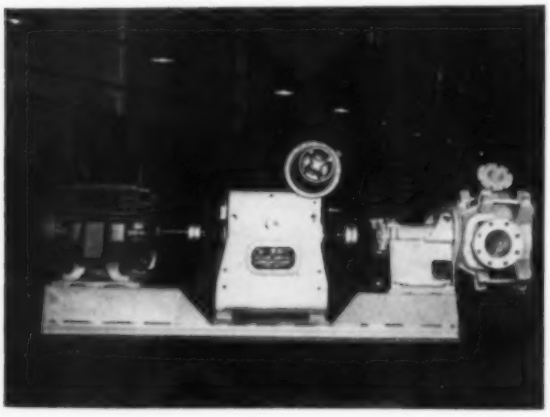
COLLOIDAL GRAPHITE substituted for ordinary lubricants has reduced chain-pin wear on a bucket elevator to a minimum at the Whitehall Pharmacal Co., Elkhart, Ind. Coal particles and dust on the bucket elevator transferring coal from the receiving pit to the plant's coal silo prevented effective lubrication with ordinary products. As a result there was rapid chain-pin wear and corrosion and maintenance cost was high.

Various ordinary lubricants were tried but were found unsatisfactory under the severe conditions. They formed films that were extremely susceptible to rupture and were quickly removed from the metal surface by the abrasive action of the fine coal.

To find a solution to the abrasion problem, Whitehall experimented with many lubricants. Colloidal graphite offered the most promise, but it took some searching to find the ideal dispersion. For example, colloidal graphite in alcohol was tested first but the alcohol evaporated too quickly for the solid lubricant to reach the chain pins. Plant engineer H. S. Mahon decided to try "dag" No. 2404, a 10% dispersal of colloidal graphite in mineral spirits, manufactured by Acheson Colloids Co., Port Huron, Mich. The mineral spirits provided good wetting action and, though volatile, it did not evaporate until after it accomplished its mission of carrying the microscopic particles of colloidal graphite to the most inaccessible part of the chain.

Results have been outstanding, according to Mr. Mahon, and the "dag" colloidal graphite produces on rubbing surfaces a graphoid film that resists oxidation, inhibits corrosion, eliminates sticking and reduces friction. Consequently, chain-pin wear has been cut almost to the vanishing point, resulting in markedly increased working life for the elevator chain.

Application of the graphite is simple. One part of "dag" dispersion No. 2404 is diluted with seven parts of mineral spirits. The combination is easily mixed by hand and applied simply and efficiently every two weeks with a standard paint-spray gun on the moving chain. Thus there is no down time. The spray gun not only lubricates the chain but also at the same time blows out accumulated coal dust.



Pump Meets Varying Needs

IMPROVED operating efficiency and lower maintenance cost are possible by using a variable-speed pump to handle abrasive material under varying conditions. The arrangement is expected to extend pump life to three times that of the old system.

Seven 4-in Type R Morris slurry pumps with Gyrol fluid drive are handling capacities ranging from 300 to 500 gpm per pump. The pump handles a material of 1.3 specific gravity which contains sand and other materials.

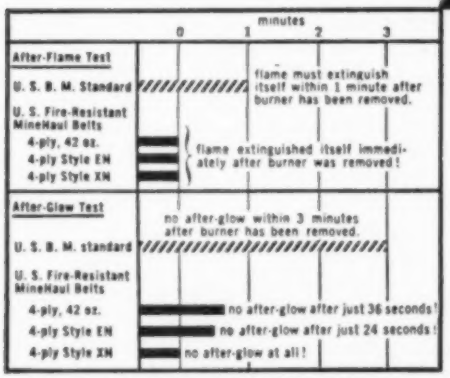
Since the pumps must handle as much as 500 gpm or as little as 300 gpm total dynamic head varies from 45 to 105 ft. Units are powered by 40-hp, 1,160-rpm motors, operating through an American Blower Gyrol fluid drive.

Before the variable-speed units were installed, changes in capacity and head were met by either manually or mechanically operated plug valves in the discharge line. However, this resulted in poor operating efficiency and high maintenance costs because of extremely high wear in the plug valves.

Fire-Resistant MineHaul Belt

MEETS and EXCEEDS all existing fire-resistance regulations

Comparison of U.S. Fire-Resistant MineHaul Belts with standards as set forth in United States Bureau of Mines Schedule 28*


minutes
0
1
2
3
After-Flame Test
U. S. B. M. Standard
flame must extinguish itself within 1 minute after burner has been removed.
U. S. Fire-Resistant MineHaul Belts
4-ply, 42 oz.
4-ply Style EN
4-ply Style XN
flame extinguished itself immediately after burner was removed!
After-Glow Test
no after-glow within 3 minutes after burner has been removed.
U. S. B. M. standard
U. S. Fire-Resistant MineHaul Belts
4-ply, 42 oz.
no after-glow after just 36 seconds!
4-ply Style EN
no after-glow after just 24 seconds!
4-ply Style XN
no after-glow at all!

*as tested in United States Rubber Company laboratories in accordance with Bureau of Mines test specifications.

Testing these belts in U. S. Rubber's own laboratory—*in accordance with Bureau of Mines specifications*—it was found that U. S. Fire-Resistant MineHaul Belts not only meet but EXCEED all existing fire-resistance standards (see chart to left).

These new belts have been given the Bureau of Mines acceptance designation: "Fire-Resistant, U.S.B.M. No. 28-5."

U. S. Fire-Resistant MineHaul Belts combine maximum fire safety with all the qualities you've come to expect in a "U.S." belt: optimum troughability, high impact resistance, outstanding rip resistance, excellent fastener-holding ability, added edge protection, mildew resistance—to name a few.

Obtainable at the 28 "U.S." District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N.Y.

Watch NCAA football, Saturday afternoons, NBC-TV

Mechanical Goods Division

United States Rubber

How to Get Batteries Ready for Winter

FREEZING WEATHER will soon be here. And batteries in trucks and tractors must be in top condition to turn engines over on cold winter mornings. Here's some useful information for keeping batteries in top condition in cold weather.

Make sure the electrolyte solution is ⅜ in above the plates. If the solution is low, add distilled water until the proper level is reached.

Battery cables and terminals should be free of corrosion. If corrosion occurs, the posts should be cleaned with a strong soda solution. Always be sure to disconnect the ground cable before cleaning, repairing, disconnecting or connecting any of the electrical cables. After posts have been cleaned, apply a thin coat of vaseline on them before reconnecting cables to prevent further corrosion.

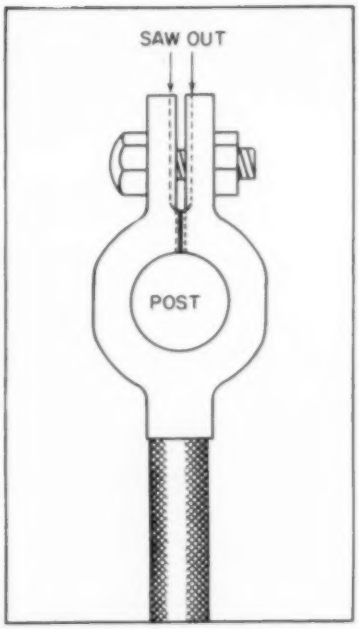
With 12- and 24-v systems, it is very important that cables be tightly secured to the posts. If the clamp does not fit tightly enough it can be made tighter by removing the clamp bolt and enlarging the slot by sawing out a double thickness of hacksaw blade.

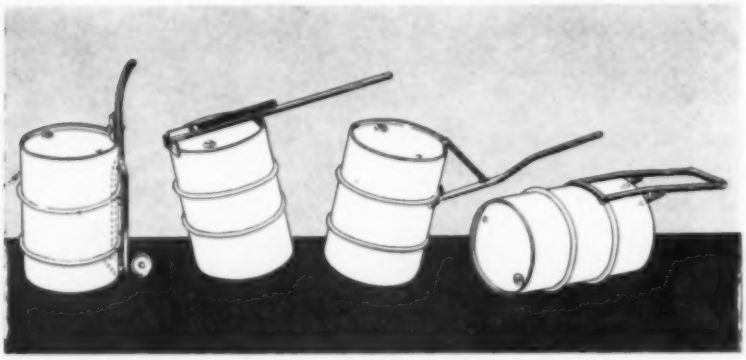
When the temperature falls below freezing, special attention should be given to hydrometer readings of the battery. The electrolyte of a fully charged battery will have a hydrometer reading of 1.280 to 1.300 specific gravity when the electrolyte temperature is 77 deg F. Remember that specific gravity readings without correction for temperature are meaningless. For example, for each 30 deg that the temperature of the electrolyte is above 77 deg F, 10 points must be added to the hydrometer reading. For each 30 deg below 77 deg F, subtract 10 points to get the true specific gravity.

If corrected readings are below 1.240 the battery is not receiving sufficient charge. The electrical system should be given a thorough check.

In zero weather there is danger of batteries freezing if the specific gravity falls below 1.175. Those with a gravity of 1.225 will freeze at 35 deg below zero.

A final suggestion—add water to the cells after the engine is started at the beginning of the shift so the water and electrolyte will be thoroughly mixed.





Handy Drum-Handling Tools Simplify These Heavy Jobs

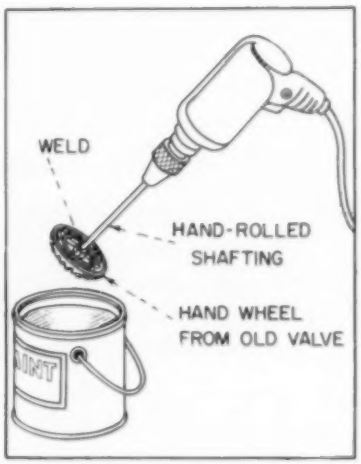
HANDLING OIL DRUMS can be a back-breaking job, even for two men. Then there is always the possibility that a drum will get away and cause damage or injury to a worker. These sketches, which appeared in *Power*, another McGraw-Hill publication, show how the job can be made easy.

The clamp on the drum dolly at the left comes in handy when placing drums on a painted floor. Just place one foot against the axle of the dolly and hold back on the handle of the tool. Normally, the drum would bang down, chipping paint, denting wood or even damaging nearby equipment.

The second sketch shows how the handy tool can be used to tilt full drums so that a dolly can be placed under one end. One man tilts the drum with one hand, shoves the dolly under with the other. Another drum-tilting tool is shown in the third sketch. This one permits the drum to be moved to the operator.

The fourth sketch shows another tool for lifting drums from the horizontal position. This must often be done when a man moves a full drum to a new position.

In each case, the tool must fit the drum accurately. Any of the tools can be made from pipe.



Valve Hand Wheel Stirs Paint

A HANDY TOOL for mixing thick, stubborn paint can be made in a few minutes, reports *Power*, another McGraw-Hill publication. A hand wheel from an old valve welded to a short piece of cold-rolled shaft does the stirring job. You simply put the stirrer into the chuck of an electric handheld drill, put the stirrer in the paint, and turn on the power. In a few minutes the tool will thoroughly mix paint that usually takes 20 min by hand.

YOUR IDEAS ARE WORTH MONEY! Your practical hints for making jobs easier or saving money are what we want in Operating Ideas.

Describe your idea on a page from your notebook and send it to: The Editor, *Coal Age*, 330 West 42nd St., New York 36, N. Y.

14,000 HOURS EACH — STILL NO MAJOR OVERHAUL
THANKS TO CITIES SERVICE LUBRICANTS

Shovel and dragline run 20 hours a day, seven days a week!

The two machines pictured above are part of the equipment used by White Cottage Coal Company in its strip-mining operation. **Each works 20 hours a day, seven days a week.** Each has given over 14,000 hours of performance without major overhaul. And each uses Cities Service Lubricants—C-300 Motor Oil, Trojan MP 140 Gear oil and Trojan A-1 Greases.

Says Superintendent Ralph Jameson: "That's the amazing kind of results we've been getting with Cities Service Lubricants ever since we first began to use them back in 1942. Today, they keep all of our equipment—shovels, draglines, bulldozers, and 18 dump trucks in top-notch condition. Cities Service products deserve a lot of credit for the efficiency of our strip operation, **and I'd recommend them to any strip miner."**

Like White Cottage and scores of other coal companies, you'll find Cities Service Lubricants can be an invaluable asset to you. For all the reasons, talk with your local Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

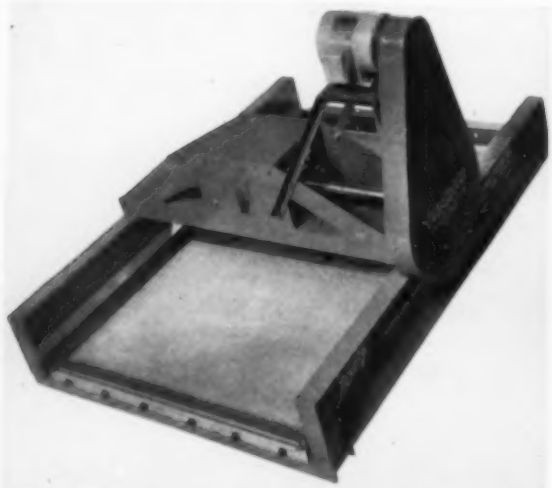
One of 18 Dump Trucks leaves load of stoker coal near railroad siding. White Cottage produces 100,000 tons per year, gives all equipment tremendous workout to meet this production figure.

Bulldozer Clears Road for other equipment. Like its big brothers, the cranes and shovels, it provides flawless performance with top quality Cities Service Lubricants.

CITIES SERVICE

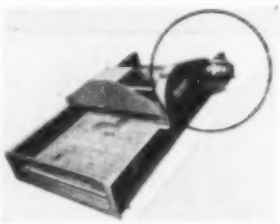
QUALITY PETROLEUM PRODUCTS

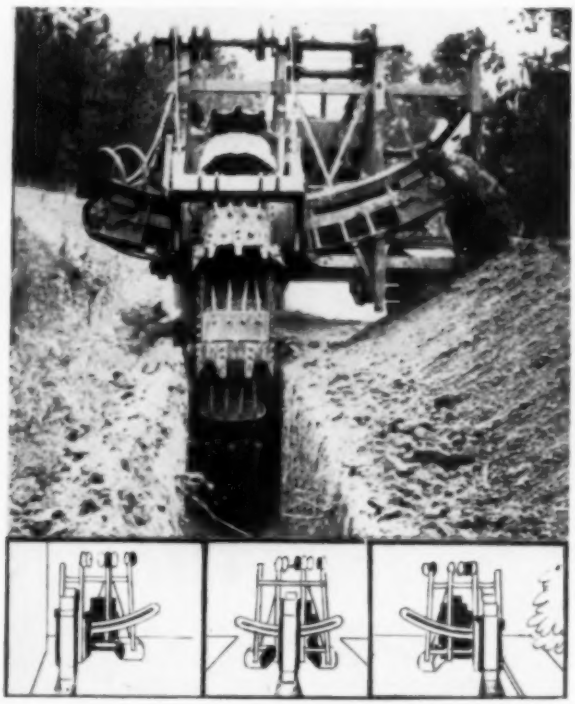
EQUIPMENT NEWS



Space-Saving Motor Mount

A motor mount design in which the motor of the Model E Leahy vibrating screen is positioned above the screen has been introduced by the Deister Concentrator Co., Fort Wayne, Ind., to meet limited space conditions. Although it is not a substitute for the Model E Leahy standard drive, in which the motor is supported by an outboard bracket (small photo), the new mount will be made for special installations. e.g., Where a large number of screens are to be installed as closely as possible, side by side, and in a battery, an important amount of space can be saved. There are also instances, Deister points out, where it may be desirable to mount a motor at a greater distance from the screen cloth. The new mount will accomplish this, the company says. Deister also points out that since the standard type of drive arrangement requires the support of an outboard bracket, screens are ordinarily paired and installed with right and left hand drives projecting from each side of a pair. With the special high motor mount design, the motor is swung in to eliminate motor projections. Only the projection of the sheaves, V-belt and motor drive guard extend beyond the screen frame.

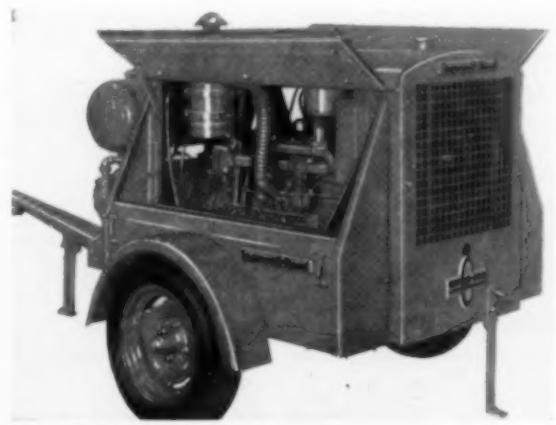




changed in the field and no crane or special tools are needed to accomplish the change, according to Gar Wood. Working specifications: maximum depth of cut, 5 ft 6 in; width, from 8 to 24 in; maximum obstruction clearance, 2¼ in. Other features: hydraulic conveyor drive, hydraulic digging wheel hoist, variable bucket spacing, split-shaft excavator drive, grouped operator controls.

Design for Ditching Versatility

Gar Wood Industries, Wayne, Mich., is building a new ditcher designed to dig to within 2¼ in of the outside edge of either its right or left-hand crawler. Dubbed the Gar Wood-Buckeye 308-TP, the ditcher has been engineered to permit an operator to shift its digging wheel to three separate positions—left, right or front. The feature overcomes expensive hand digging that is often necessary when conventional ditchers meet such obstructions as buildings, poles and fences. The 308-TP eliminates the necessity of straddling a trench. The unit will, in fact, dig in its own track marks. The position of its digging wheel can be



Portable 85 Cfm Compressor

An 85 cfm size compressor is being manufactured by the Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., as an

Why Zacherl Coal Company is switching to Caterpillar power

A little over five years ago, Zacherl Coal Company of Oil City, Pa., installed a CAT* D318 Diesel Engine in a Lorain shovel. In the more than 5 years of tough operation, *the engine has not been touched.* Since then, the company has bought nothing but Caterpillar power: a D375 in a P&H 80-ft. dragline, a D337 in an Osgood shovel, and a D318 in a Bucyrus-Erie shovel.

The firm is now 80% standardized on Caterpillar power. "As long as we get this kind of service we'll stick to Caterpillar," says Eugene Zacherl, a partner.

Many experienced coal men know that it pays to standardize on Caterpillar Diesel Engines. With their aluminum alloy bearings, "Hi-Electro" hardened crankshaft and cylinder liners, foul-free fuel injection and really effective oil, air and fuel filters, Caterpillar Engines are designed to do more work at lower cost over a longer time than any other engines built.

There is a full range of new and modern Caterpillar Diesels to 650 HP (maximum). Leading manufacturers install Caterpillar Engines as original power in their equipment. And there's a Caterpillar Engine as replacement power for almost any shovel ever built.

See your Caterpillar Dealer for full information on the new line of Caterpillar Diesels. And specify Caterpillar when you repower or order new equipment.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

MODERN
HEAVY-DUTY POWER

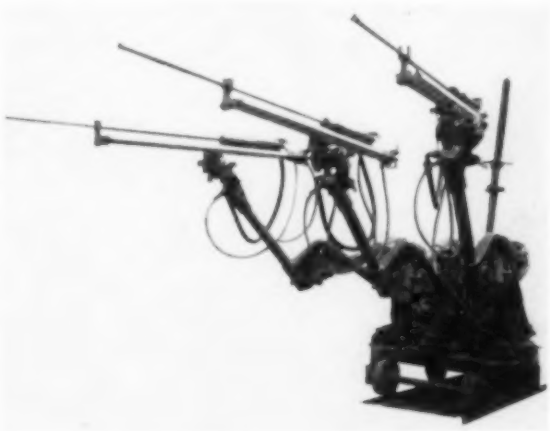
addition to the company's line of Gyro-Flo compressors. The "85" weighs 1,840 lbs fully equipped with running gear, 1,375 lb stripped (42 in high) for mounting on a truck. Driven by a Continental motors F-140 four-cylinder, four-cycle, "L" head gasoline engine, the 85 Gyro-Flo is equipped with push button starting and a 6-v battery system. Although it is the smallest in the Gyro-Flo group (85, 125, 210, 315, 600 and 900 cfm), the 85 is said to contain most of the design features of the larger sizes.

Attachment Boosts Loading Height

To load gondolas or high-sided trucks the Construction Machinery Div., Clark Equipment Co., is manufacturing a new high-lift bucket. Designed for the Michigan Model 175A tractor shovel, the new attachment increases bucket dumping height 3 ft 7 in. It raises the bucket's lower edge to 12 ft 1 in. In the photo the height of the standard Model 175A is compared with a similar tractor shovel that has been fitted with the high-lift bucket. Clark Equipment says it will forward complete details from its Benton Harbor, Mich., office.

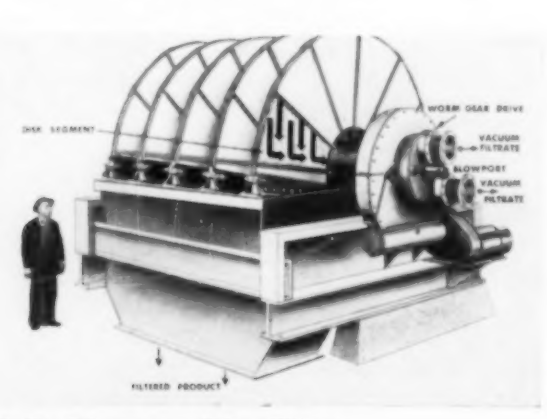
¾-Yd Shovel, 18-Ton Crawler Crane

A ¾-yd shovel and 18-ton crawler crane said to be easily convertible to shovel, dragline, clamshell, crane and hoe has been designed by the Marion Power Shovel Co., Marion, Ohio. The unit will be known as the 35-M and will be offered both with crawler and truck mountings. The truck crane will be known as the 35-MR and is rated at 25 tons. Principal design and construction features, in addition to the convertibility, are: 1) air controls; 2) low maintenance, self-cleaning, non-clogging crawlers which feature a drive sprocket design that sheds dirt and close-spaced crawler shoes designed to prevent material from wedging; 3) heavy design and construction; 4) independent boomhoist for power-up power-down control of the boom; 5) anti-friction bearings on high speed rotating parts and hook rollers. Optional features include torque converters, independent travel, high gantry for booms over 55 ft, power removable counterweight, optional crawler mountings.



Three-Boom, Air-Operated Jumbo

A three-boom mining drill jumbo, believed by the manufacture to be the first completely air-operated unit of its type, has been introduced by the Thor Power Tool Co., 175 N. State St., Aurora, Ill. Scheduled for an unveiling at the American Mining Congress last month in Los Angeles, the drill jumbo is expected by Thor to save users as much as 50% in time and costs. The jumbo operates at maximum efficiency in an area as large as 18 ft wide, 10 ft high, according to Thor officials. It weighs in at 7,800 lb equipped with drifter rock drills and mountings. One man can operate the unit's three booms without leaving his station at the air controls. The three booms can support either power feed, chain feed and air bar feed mountings, Thor says.



9-Ft Diameter Disc Filter

A 9-ft diameter disc filter being manufactured by the Denver Equipment Co., 1400 17th St., Denver 17, Colo., has been designed with a 105 sq ft filter area per disc. In addition, the usual number of 10 segments per disc has been replaced with

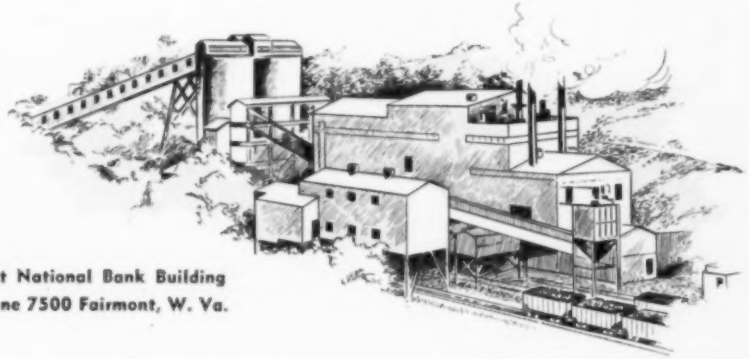
...for efficient handling and cleaning

Real personal care is a factor in upbuilding any project. At Industrial everyone pitches in as though he were building his own plant with his own money. Collaboration from every man, and from every department results in smooth operations . . . money-saving operations.

In coal cleaning plants, for example, proper separation is accomplished and each size guided to its proper destination, with a minimum of effort resulting in important savings.

Write for conference with our engineers, no obligation.

INDUSTRIAL
Engineering & Construction Co., inc.
FAIRMONT, W. VA.



First National Bank Building
Phone 7500 Fairmont, W. Va.

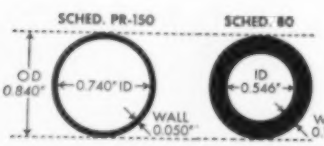
12 segments. Denver Equipment says this innovation permits greater filter capacity for removing fine solids from suspension, since more complete segments are under vacuum during each revolution. Denver Equipment adds that its filter segment design provides gravity drainage prior to discharge. The result is a drier filter cake. Flexible bellows type hose is provided to prevent tension on the unit's valve cover. Available in sizes up to 12 discs. The filter is explained in detail in "Deco's" bulletin, "Trefoil." Box 5268, Denver, Colo.

Heavy Duty Wagon Drill

A heavy-duty wagon drill constructed with its feed shell behind the center line of the large wheel axles to provide a substantial drilling carriage, and with an air motor feed that eliminates most steel sticking, is being manufactured by the Le Roi Div., Westinghouse Air Brake Co. The drill, the DR40, is designed for vertical or horizontal drilling in hard formations; it is light in weight and reportedly quite maneuverable. Added strength is said to be obtained by using a light-weight welded tubular U bar. Adjustable swivel wheels are locked into position for line or face drilling. Including the feed shell and D14DR 4-in drifter, the entire units weighs 1,500 lb. The D14DR drifter, recommended for use with the wagon drill, is used with a 400-lb, 13-ft feed shell that has been engineered for a feed travel of 10 ft. Holes can be drilled at any angle in any direction to a depth of 24 ft without using steel racks. The U bar construction mentioned above permits drilling in nearly any position. The air motor used with the DR40 is of durable lobe cylinder construction. A seven-blade rotor provides alternate power from opposed lobes. This produces 14 power impulses in each motor revolution. Standard equipment: a 2 gal capacity line oiler requiring filling once a day; two 6.00-16 tires ,one 4.00-8 caster tire.

Convertible Crane's Capacity 35 Tons

Thew Shovel Co., Lorain, Ohio, has added a 35-ton capacity Moto-Crane (model MC530W) to the Lorain line of power shovels and cranes. Convertible to crane, clam, dragline or hoe, the new unit is powered by either gasoline or diesel engines. Its carrier is 122 in wide, 28 ft 6 in long, and can be supplied with 6x6, 6x4 and 8x4 axle arrangements. The carrier's turntable is mounted on the Lorain "Shear-Ball" mounting, a device said to eliminate adjusting and maintaining center pins, center pin nuts and top or bottom rollers. The turntable, itself, may be gasoline-powered with hydraulic coupling power take-off or diesel-powered with a torque converter. The Moto-Crane's hoist and swing drums are mounted on anti-friction bearings and its rear counterweight is removable for reduction in highway weight. Its square-tubular-chord boom can be used up to 110 ft. Two-piece, 20-ft tip extensions of the same design are available and are extendable to 30 and 40-ft lengths with center sections. For highway travel up to 37 mph the boom (pin-connected) can be folded. And for long service (up to 130 ft to 170 ft with a tip), booms with wide bases can be ordered. Standard equipment: a 14-ft sq tubular mast gantry; an eight-part floating boom harness, a boom lowering device, a cable boom stop, swing brake, and a third boomhead sheave.



Thin-Walled Plastic Pipe

A line of light wall polyvinyl chloride pipe with a uniform pressure rating in all sizes has been introduced by the Alloy Tube Div., The Carpenter Steel Co., Union, N. J. Known as PR-150, the pipe is an addition to the company's Schedule 40 and Schedule 80 pipes. Its thinner wall and larger inside diameter give the new pipe greater flow capacity than either the 40 or 80 sizes. Two basic types are offered—one with a high chemical resistance and maximum working pressure of 150 psi at 73 deg, the other with a high impact strength and a rating 125 psi at 73 deg. Eight sizes are available from ⅛ in to 4 in. The manufacturer recommends the pipe for mining.

Cable Built for Endurance

Simplex "Anhydrex XX" cables, said to defy ozone damage, heat and moisture after a series of comparison tests with other cables, is being manufactured by the Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass. Simplex says the cable's insulation will retain its physical and electrical properties longer and at higher temperatures than earlier types of insulation. The cable is also said to retain its low water absorption

New CAT* No. 9 Ripper FOR THE Mighty D9!

First choice for push-loading, the D9 is now more versatile than ever. The new No. 9 Ripper lets the D9 rip tough or frozen material between loading cycles. Faster, easier scraper-loading cuts time and costs.

TRACTOR-MOUNTED

The tractor-mounted No. 9 Ripper utilizes the weight of the D9 to force the teeth into hard material. No need for ballast or extra weights. The hydraulically operated ripper affords maximum maneuverability because it is tractor-mounted.

"LIVE DRIVE" HYDRAULIC PUMP

New No. 50 Hydraulic Control has a constant power pump that supplies the capacity to raise or lower ripper teeth *independently* of flywheel clutch or torque converter.

TWO RIPPING POSITIONS

Shanks may be pinned in either of two ripper positions which provide either maximum ground clearance when raised or maximum penetration (up to 28") when lowered.

TRIPLE TEETH

Use one, two or three. Any or all of them can be swung up and pinned out of the way. Teeth pivot 10° to either side. This permits tractor steering and smoother ripping through rocks. Shanks are heat-treated alloy steel, with hardened alloy cast steel boots. Points are hardened cast steel, *pin-attached* for easy replacement.

MANY OTHER IMPORTANT FEATURES!

Now the new No. 9 Ripper makes the "King of the Crawlers" an even more profitable and versatile machine. Mail the coupon for full details, or call your nearby Caterpillar Dealer. And remember, you can count on him for reliable service, and for parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

MODERN HEAVY-DUTY TRACTOR RIPPERS

MAIL TODAY!

Caterpillar Tractor Co., Dept. D-100, Peoria, Illinois
I would like more information on the new No. 9 Ripper

*Name*_____
*Company*_____
*Address*_____
*City*_____ *Zone*_____ *State*_____

Remove 4 Bolts and there's the impeller! . . . no need to disconnect piping

MORRIS
TYPE RX
Slurry Pump

Write for specifications, capacities, performance charts, and other helpful information. Ask for Bulletin 185.

Morris Type RX is the slurry pump whose impeller can be removed without disturbing the suction and discharge piping or the bearings! To get at the impeller and renewable shaft sleeve, you simply loosen four outside clamping bolts—slip them out of disc slots—take off the end cover. Impeller unscrews from shaft threads; shaft sleeve is removed through end cover opening.

At no point do you have to dismantle the piping. Lay-up time costs are less . . . pump is back in service quicker.

Use the Morris Type RX in Your Mining Operations

Morris Type RX is the product of nearly a century of experience in designing and building materials-handling pumps. It is specifically engineered to handle mixtures containing ore concentrates . . . tailings, slag and residue from filters and classifiers . . . all types of caustic or acid mixtures containing abrasives or solids.

MORRIS CENTRIFUGAL PUMPS

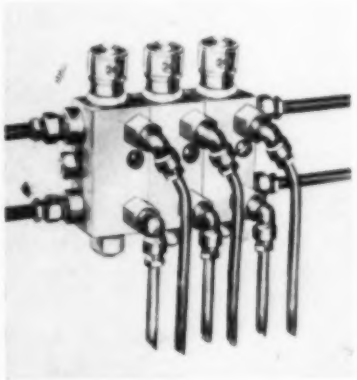
MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Branch Offices in Principal Cities

Equipment News *(Continued)*

ability after long use. It is insulated with a butyl-based, ozone-resistant compound which has the ability to "relax" even when curved or bent, according to Simplex, which points out that this means there are no points of tension in Anhydrex XX for ozone to attack.

Replaceable Digger Teeth

Allied Steel & Tractor Products, Inc., 7835 Broadway, Cleveland 5, Ohio, is manufacturing Bulldog replaceable digger teeth for shovel dippers, back hoe buckets, dragline buckets, clamshell and loader buckets. As a universal weld-on adapter unit, the Bulldog package consists of three parts—a weld-on adapter that uses the old tooth as a base; a replaceable tip; and two lock pins for securing the tips to the adapter. The adapters are made in 15 widths, from 2¼ in to 7 in.



Lubrication Cycle Counter

A lubrication cycle counter manufactured by Alemite Div., Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill., provides visual counting as a guard against faulty lubrication. The counter also provides an automatic and permanent record of bearing lubrication.

We say this without reservation—will back it up with proof:

New Balanced Mobil D.T.E. Oils Can Improve Your Production And Reduce Manufacturing Costs

For years Mobil D.T.E. oils have set the standard of quality for all hydraulic and circulating oils. Recently they were dramatically improved—so much so that their margin of superiority is now greatly increased.

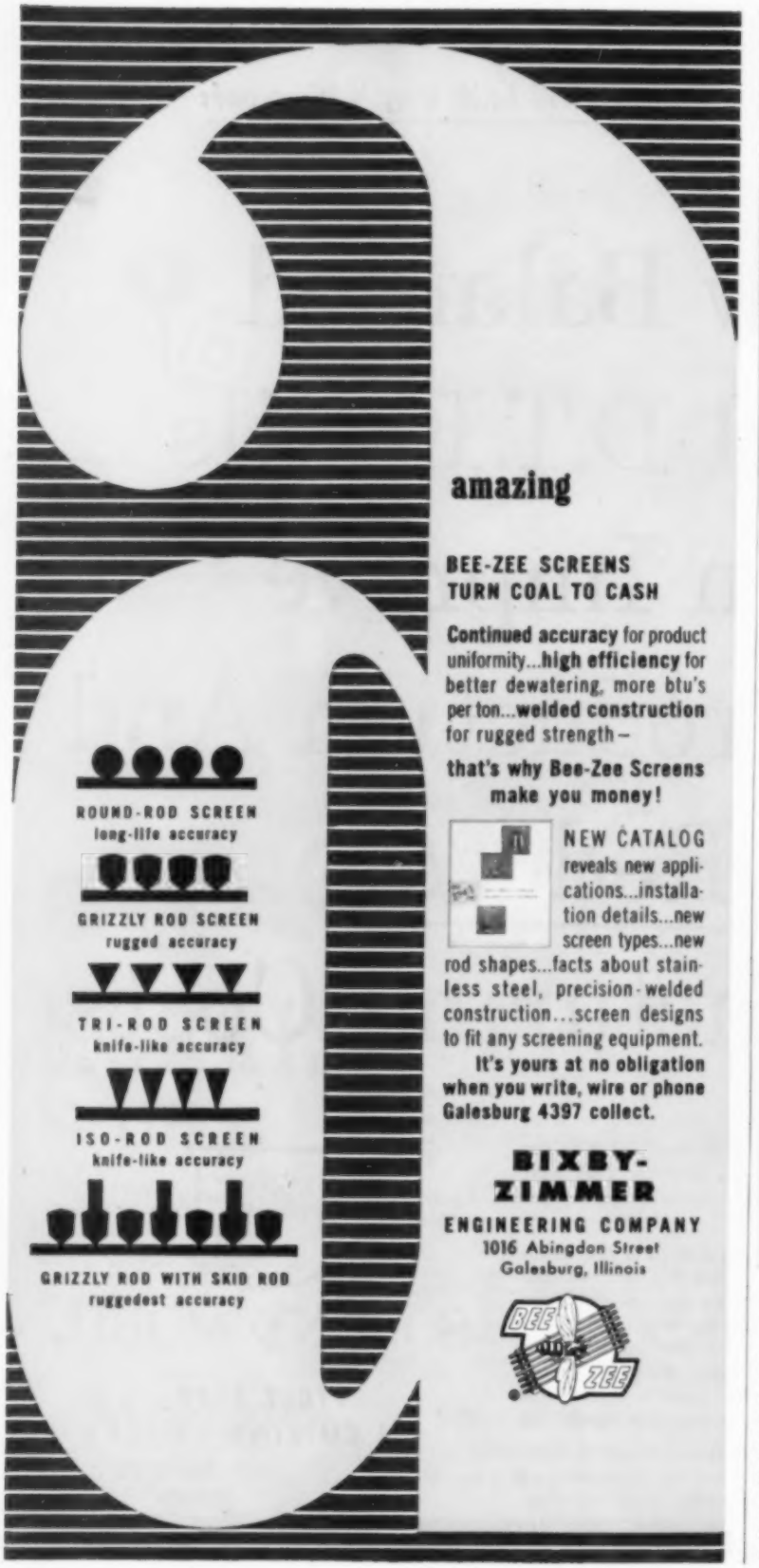
New Mobil D.T.E. oils are *balanced* to meet the widest range of operating conditions. They will give years of trouble-free service—even in continuous high temperature circulating systems. They will keep your machines free from deposits over the complete range of service. They will give you the highest degree of protection against wear...rust...corrosion. In fact, tests show *most machines will become obsolete before these oils need changing* when operating at normal temperatures.

Let us show you concrete *proof* that new balanced Mobil D.T.E. oils can improve production and cut manufacturing costs. Ask your Mobil representative for the "balanced" story.

SOCONY MOBIL

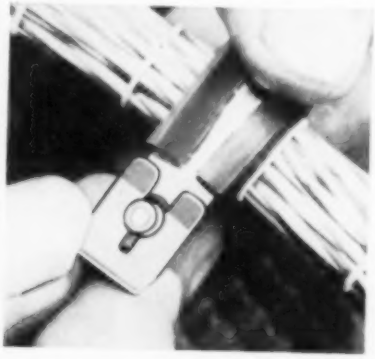
FIRST STEP IN CUTTING COSTS

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION


ROUND-ROD SCREEN
long-life accuracy
GRIZZLY ROD SCREEN
rugged accuracy
TRI-ROD SCREEN
knife-like accuracy
ISO-ROD SCREEN
knife-like accuracy
GRIZZLY ROD WITH SKID ROD
ruggedest accuracy
amazing
BEE-ZEE SCREENS
TURN COAL TO CASH
Continued accuracy for product uniformity...high efficiency for better dewatering, more btu's per ton...welded construction for rugged strength—
that's why Bee-Zee Screens make you money!
NEW CATALOG
reveals new applications...installation details...new screen types...new rod shapes...facts about stainless steel, precision-welded construction...screen designs to fit any screening equipment.
It's yours at no obligation when you write, wire or phone Galesburg 4397 collect.
BIXBY-ZIMMER
ENGINEERING COMPANY
1016 Abingdon Street
Galesburg, Illinois
BEE ZEE

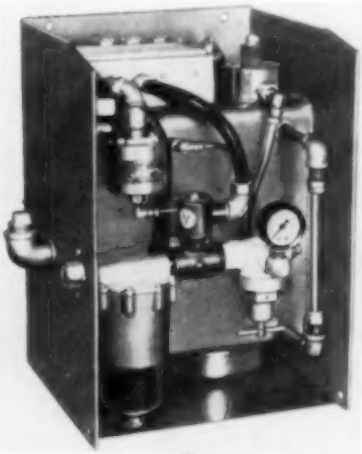
Equipment News *(Continued)*

Named the Accumatic lubrication recording cycle counter, the unit is used with Type II accumatic valves in centralized lubrication systems.



Trouble Saving Wiring Clip

Pastushin Industries, Inc., 5651 W. Century Blvd., Los Angeles 45, Calif., is marketing what it calls a trouble-saving steel fastener clip designed for sliding around the bolt of a wiring clamp or hose clamp to hold tension during arranging and while screwing on a nut. Named "Clip-It," the device can be inserted around a clamp bolt to fasten or release the clamp's prongs for adjustments while wiring bundles and lines are arranged. The device is about the size of a fingernail.



Oil Mist Lubrication

Two alemite oil-mist lubricators designed to provide a 48-hr week of continuous lubrication for up to 300 or 500 in (1 bearing in equals 1 in of shaft diameter) of lubricated mechanisms while consuming only 1/10th as much oil as any other method of lubrication are being produced by the Alemite Div., Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill. Whether a compact installation or an extended one, the lubricators will operate efficiently with auto-

Does a trip of Mine Cars ever wear out?

No! Effectively, a mine car trip *never* wears out. When one car needs repairs, you simply shunt it to a siding in a couple of seconds...and the rest of the cars keep rolling out the tonnage. When you retire a car after a long, hard life, it's just one car, not a major over-haul. One car at a time over the years, a mine car trip is kept young and productive with ordinary maintenance and repair.

And acf Constant Haulage Mine Car Systems offer additional advantages. *Flexibility:* extending or changing your line is relatively simple when there's only track to move. *Two-way payloads:* men and supplies can ride into your mine in cars that carry the coal out.

Actual cost and production figures, supplied by mine operators, show the many advantages of acf Constant Haulage Mine Cars. Ask your acf Representative. Just write, wire, or phone any acf office.

AMERICAN CAR AND FOUNDRY DIVISION

acf Industries, Incorporated. *Sales Offices:* New York–Chicago–St. Louis – Cleveland – Washington – Philadelphia – Berwick – Huntington–San Francisco. *Plants:* Berwick, Pa.–Huntington, W. Va.

acf

MINE CARS

for Constant Haulage

matic control of all conditions, according to Alemite. In operation the lubricators atomize oil into oil particles lighter than air. The particles are distributed through tubing to mechanisms requiring lubrication. There are no moving parts, thus there is nothing to wear out, says Alemite. A constant, uniform volume of fresh oil film is picked up by each bearing as it needs it, and the dry flow of air through the bearings acts as a coolant. Alemite also points out that the lubricators reduce machine shutdowns for oiling.

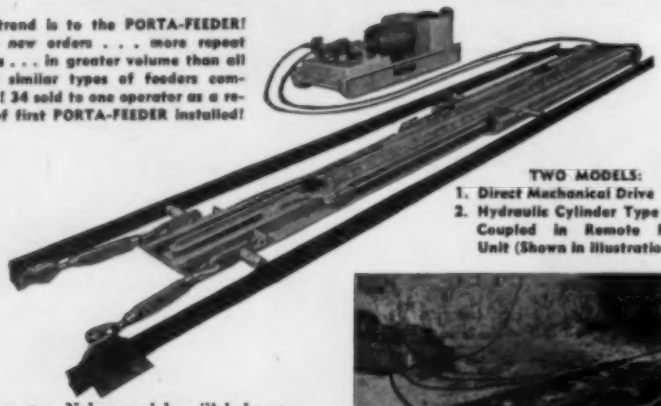
Tachometer Takeoff Heads

Metron Instrument Co., 432 Lincoln St., Denver 9, Colo., announces the Series 34 tachometer takeoff heads for use with Metron indicators. The new heads measure speeds between 100 and 5,000 rpm and are available with SAE screw mounts for gasoline, diesel, railway or stationary engines and compressors. No brushes, slip rings or parts requiring regular maintenance have been used in the heads. A double pole, double throwswitch (dpdt) with a capacitor senses speed when the takeoff shaft rotates in either direction.

A current, exactly linear with respect to speed, is transmitted to a centrally located Metron indicator up to 1,000 ft away. Very little operating torque is required. The unit must be used with a Metron indicator, the company says.

Large Coal Company in Southern West Virginia Operates 34 NOLAN PORTA-FEEDERS

The trend is to the PORTA-FEEDER! More new orders . . . more repeat orders . . . in greater volume than all other similar types of feeders combined! 34 sold to one operator as a result of first PORTA-FEEDER installed!

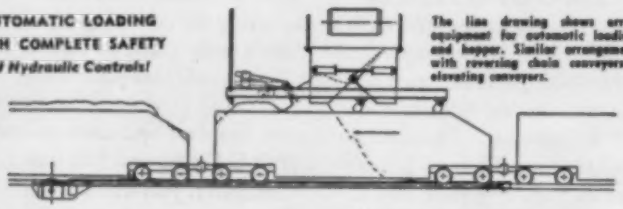


TWO MODELS:
1. **Direct Mechanical Drive**
2. **Hydraulic Cylinder Type Hose Coupled to Remote Power Unit (Shown in Illustrations)**

These two Nolan models will help you meet every requirement and condition in spotting cars for loading . . . *and can save you many shift hours per day!* The Porta-Feeder mounts between the rails on top of the track ties, and is secured by rail clamps. No excavation or preliminary foundation work is necessary. There are no ropes or cables. Reciprocating pushing dogs deliver constant forward feeding motion.

The Nolan Porta-Feeder has been in successful use in many mines for over ten years. We will be glad to show you a mine in your vicinity where the Nolan Porta-Feeder is operating. Write us now.

AUTOMATIC LOADING WITH COMPLETE SAFETY
All Hydraulic Controls!

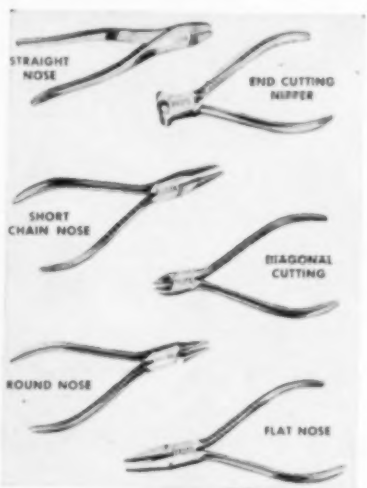


The line drawing shows arrangement of equipment for automatic loading from belt and hopper. Similar arrangements are used with reversing chain conveyors (yoyos) and elevating conveyors.

NOLAN SALES AGENTS:
- George C. Hutchinson, Jr., 1304 Koppers Bldg., Pittsburgh, Pa.
- Huntington Supply & Equipment Co., Guaranty Bank Bldg., Huntington, W. Va.
- John Lloyd & Sons, 33 Bennett Bldg., Wilkes-Barre, Pennsylvania
- E. C. Howe Machinery Co., 1725 Champa Street, Denver 2, Colorado
- Frank C. Monmoott, P.O. Box 154, Castle Gate, Utah
- Ames A. Culp, 429 South 24th Street, Birmingham 5, Alabama
- John North Associates, P.O. Box 105, Harbert, Mich. (Chicago District)

NOLAN

THE NOLAN COMPANY
106 Pennsylvania Street • Bowerston, Ohio



Matched Midget Pliers

Six midget pliers designed for precision work on small objects and in tight places are being manufactured as a matched group by the Plomb Tool Co., Los Angeles, Calif. The pliers were developed especially for electrical workers and are from 4 to 4¾ in long. They include slim, straight nosed units with sharp milled teeth; taper jaw units with flat inside surfaces; round nose for looping; cutters; and forming pliers. They are being sold under the trade name "Proto."

Head Protector

A cap that protects the head in close

west virginia's

TIME SAVING *new* CONE-NECK BOLT

FACILITATES ON-THE-JOB ASSEMBLY ▶ Washer slips on right over the assembled unit. No more costly on-the-job assembly problems.

GIVES YOU A FASTER, SAFER INSTALLATION ▶ It's quicker — it's easier . . . and thanks to the cone shaped neck of the bolt, the washer fits centrally and closely. It's guaranteed safer.

STYLE R AND WEDGEGRIP UNITS AVAILABLE FOR ALL ROOF CONDITIONS

BETTER PRODUCTS · West Virginia STEEL & MFG. CO. · FOR BETTER MINING

west virginia steel and mfg. co.

BOX 316 HUNTINGTON, WEST VIRGINIA

Profitable for Cleaning All Kinds of Fine Coal

The SuperDuty® DIAGONAL-DECK® Coal Washing Table is made in two models for the cleaning of different types of coal feeds.

For high refuse feeds, the Model HCRD table provides extra discharge capacity for efficiently meeting abnormal refuse conditions.

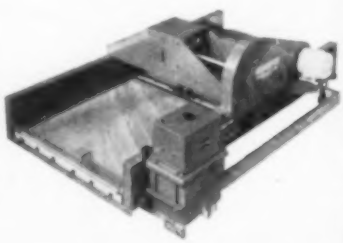
For the more usual feeds of lower refuse content, the Standard SuperDuty Table is used.

Either model delivers exceptionally clean washed coal while recovering more coal from the feed than is possible with any other fine coal washing process.

For detailed information, write for Bulletin 119.

FOR SCREENING ECONOMY

All New Model Leahy® screens utilize proven differential vibration that snaps oversize wedging particles loose 1600 times per minute. When dust is a problem, totally enclosed models are available. For damp screening, FlexElex electric heating of the screen jacket insures full-time open mesh. For wet screening CONCENCO® spray nozzle arrangements are available.



THE DEISTER ★
CONCENTRATOR
COMPANY
903 Glasgow Ave. • Fort Wayne, Ind., U.S.A.
CONCENCO PRODUCTS

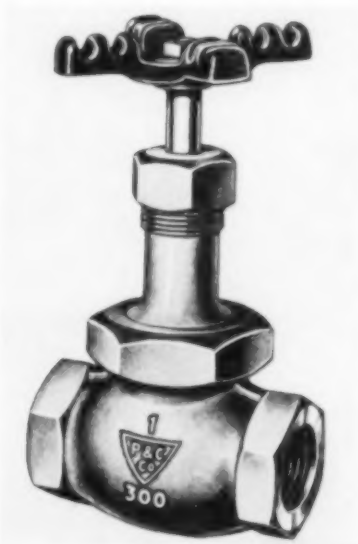
★ *The ORIGINAL Deister Company* ★ *Est. 1906*

Equipment News *(Continued)*

quarters, where bumps and cuts are a problem, is being manufactured by the Safety Div., Boyer-Campbell Co., 6540 St. Antoine, Detroit 2, Mich. Designated No. 75, the cap is adjustable to any head size. Its sweat band is padded and removable.

Loader-Operated Winch

A low cost wheel winch developed by Ternac, Box 556, Libertyville, Ill., is being manufactured for four-wheel drive bucket loaders. Operated from a loader's controls, the unit utilizes the ability of the loader to have its front wheel drives raised and rear drive axle disconnected. With the front wheels off the ground and powered, the wheel-mounted winch rolls up cable, pulling the load toward the stationary vehicle. Weight transfer to the bucket cutting edge anchors the vehicle and prevents it from being drawn to the load.



For Continuous Control

A bronze globe valve of heavy duty construction, the 427-DP, is recommended for industrial applications of steam, water, oil and gas where continu-

MINER'S PICK

The right heft and a sharp point always. Points of highest quality heat-treated tool steel are set in tapered sockets, easy to renew when worn. Heads made from special steel, properly designed for weight and balance.

No. 6-10 Complete with handle and two points

No. 6-2 Points only

The BOWDIL COMPANY . . .

CANTON, OHIO Phone GLendale 6-7176

ROPE SOCKETS

Installs in a jiffy—without tools. You just position the rope, place wedge shaped cap on. The greater the rope tension, the tighter it holds. Offset eye design allows straight out pull, a big safety and strength feature. High tensile alloy steel, heat-treated.

7-4A ..... ½" ROPE
7-6A ..... ⅝" ROPE
7-7A ..... ¾" ROPE

Take advantage of

25 YEARS EXPERIENCE

MANUFACTURING

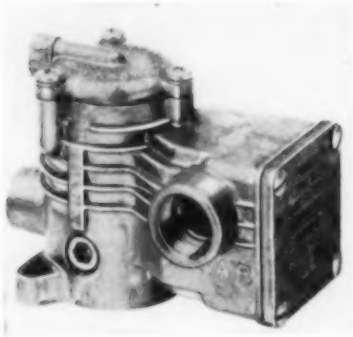
FORGED ALLOY STEEL

Teeth that really dig

H & L TOOTH COMPANY

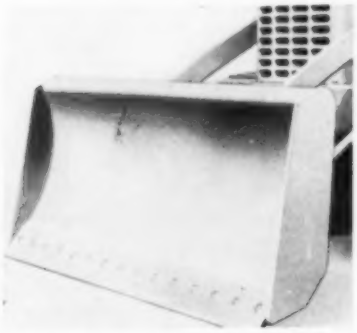
1540 SOUTH GREENWOOD AVE. MONTEBELLO, CALIFORNIA

ous control or regulation is necessary. The manufactureres, R-P&C Div., American Chain & Cable Co., Reading, Pa., says that the valve is particularly effective for frequent or continuous throttling. Its stainless steel disc and seat ring resists wire-drawing effects by high velocity currents and abrasion by gritty particles. Engineered with full-plug construction, the valve is rated at 300 lb steam, 55 deg maximum—1,000 lb owg (oil, water, gas) in ½-in to 2-in sizes, 600 lb owg in 2½-in and 3-in sizes. Hydrostatic test pressure in ¼-in size to 2-in size is 1,500 lb, 800 lb for the 2½-in and 3-in sizes.



Solenoid Pilot Valves

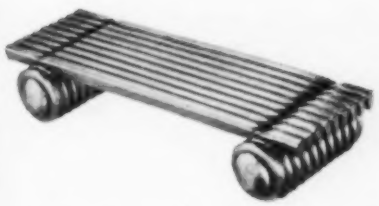
A line of small solenoid pilot valves for handling air, vacuum, oil, water and inert gases is being manufactured by the Valvair Corp., 454 Morgan Ave., Akron 11, Ohio. The valves are designed for control of Speed King remote pilot operated valves or direct control of small cylinders and similar devices. They are available in both two- and three-way types. Valvair says the new units are used in laboratories and on precision production equipment where accurate control and quick response are necessary. Capacities range up to 23.8 cfm air and 3.8 gpm hydraulic. Reportedly, the valves are capable of controlling more than 600 cycles per minutes.



Bulldozer Blade Attachment

A 104-in bulldozer blade attachment for the No. 977 Traxcavator is being manufactured by the Caterpillar Tractor

THE LAST WORD IN SCREENING EFFICIENCY



The word's out on wedge wire and ***Hendrick has it!***

That's right. With the addition of new Hendrick Wedge Wire, Hendrick now makes available a complete line of screens for the best in efficient, low-cost screening, dewatering and filtering operations. It's ideal wherever it is important that screen openings be minutely fine, have excellent draining qualities and a high degree of accuracy and rigidity. For details on how Hendrick Wedge Wire can best be applied to your specific requirements and afford tops in low-cost, efficient screening, call your nearby Hendrick Sales Engineer. He's listed in your local classified telephone directory under ***Perforated Metals.***

SEE OUR CATALOG IN SWEET'S

Hendrick
MANUFACTURING COMPANY
41 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities

Perforated Metal • Perforated Metal Screens • Wedge-Slot and Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hendrick Hydro-Dehazer

YOU DON'T NEED TO BELIEVE OUR ADS!

We could say anything and naturally anything we say could be prejudiced.

Ask STAMLER USERS why they buy . . . why they repeatedly re-order . . . why they change from competive makes to STAMLER!

We will be glad to assist you in obtaining this information.

STAMLER
LOADING POINT
EQUIPMENT

W. R. STAMLER CORP.
PARIS, KENTUCKY

SCHROEDER BROS., Exclusive Eastern Sales Agent
PITTSBURGH, PENNSYLVANIA
UNION INDUSTRIAL CORP., Carlsbad, New Mexico
SALMON & CO., BIRMINGHAM, ALABAMA

Dependable McLanahan Black Diamond Crushers crack large or small lumps of coal or similar materials to desired size with a minimum of fines. These machines are the answer to your coal crushing problems, and are built to handle high tonnages. Available in a complete range of sizes and types. These single and double roll crushers are constructed of cast steel, semi-steel, or fabricated steel, with bronze or anti-friction bearings for a long life of satisfactory service.

Write Today

for Bulletins
BD-457
BDDR-255

McLANAHAN & STONE
CORPORATION
PIT, MINE AND QUARRY EQUIPMENT HEADQUARTERS SINCE 1835
250 Wall Street, Hollidaysburg, Pennsylvania

Equipment News *(Continued)*

Co., Peoria, Ill. The new blade gives buyers a choice of two blades for the No. 977 Traxcavator—straight or angle blades. The new straight blade is useful for leveling, cleanup and backfilling. It fastens to the lift arms with a bracket arrangement at the same point at which the bucket is connected.

Automatic Blade Control

An automatic blade control for Caterpillar No. 12 motor graders, designed to maintain the grader blade at any desired slope regardless of uneven terrain, has been developed by Preco Inc., Los Angeles. Reportedly, the control is accurate to within ⅛ in in 10 ft. Caterpillar says an operator can finish a grade in a single pass at higher speed and with accuracy when conditions permit the blade to carry all surplus material. An operator selects a desired slope on a dial. In operation, he raises or lowers the blade to control cutting depth, but the slope will remain as selected regardless of how the grader frame may be affected by the surface.

Steel Used in Truck Tire

United States Rubber Co. discloses that it is fabricating a truck tire constructed with a steel wire shield between tread and carcass. The tire, says the company, is designed especially for heavy

TOUGH HEAVY DUTY MINING CABLES *that have no equal!*

New SUPERTUF JACKET* makes SUPER SERVICE MINING CABLES *tougher than tough*

*General Cable's remarkable Flame Resistant SUPERTUF JACKET is a new neoprene compound processed for maximum lasting toughness, high density and tensile strength—*extra smooth* for wear, cut and tear resistance.*

General Cable... *at your service!*

GENERAL CABLE CORPORATION, 420 Lexington Avenue, New York 17, N. Y. Offices and Distribution Centers Coast-to-Coast

CRUSH COAL

TO DESIRED SIZE

to meet all demands the efficient, economical, and practical way

McLANAHAN BLACK DIAMOND CRUSHERS

Dependable McLanahan Black Diamond Crushers crack large or small lumps of coal or similar materials to desired size with a minimum of fines. These machines are the answer to your coal crushing problems, and are built to handle high tonnages. Available in a complete range of sizes and types. These single and double roll crushers are constructed of cast steel, semi-steel, or fabricated steel, with bronze or anti-friction bearings for a long life of satisfactory service.

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250 Wall Street, Hollidaysburg, Pennsylvania

Equipment News *(Continued)*

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Automatic Blade Control

An automatic blade control for Caterpillar No. 12 motor graders, designed to maintain the grader blade at any desired slope regardless of uneven terrain, has been developed by Preco Inc., Los Angeles. Reportedly, the control is accurate to within ¼ in in 10 ft. Caterpillar says an operator can finish a grade in a single pass at higher speed and with accuracy when conditions permit the blade to carry all surplus material. An operator selects a desired slope on a dial. In operation, he raises or lowers the blade to control cutting depth, but the slope will remain as selected regardless of how the grader frame may be affected by the surface.

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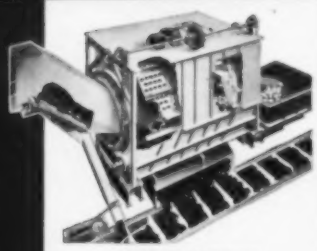
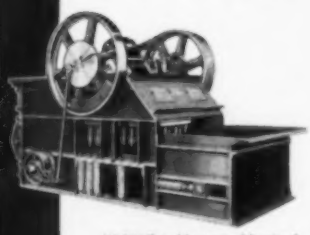
America's most complete line of CRUSHING EQUIPMENT



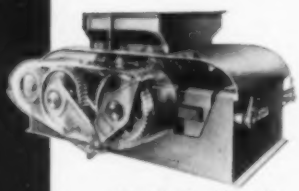
McNally Pittsburg Rotary Breaker

This unit allows positive control of top size in handling run-of-mine washery feed. Production of fines is held to a minimum.



McNally Norton Vertical Pick Breaker

50% Less fines when reducing lump to egg and stove sizes.

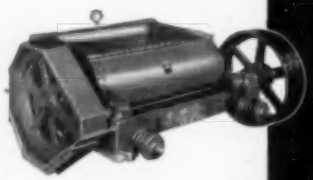


McNally Double Roll Gearmatic ROM Breaker

Built in tonnage ranges from 750 tph to 1400 tph. Full floating gearmatic drive.

McNally Gearmatic Stoker Coal Crusher

This unit offers three prime advantages: high volume production, plus accurate sizing, plus low percentage of fines.



McNally Single Roll Crusher

Universal application 20", 24" and 36" diameter rolls.

AVAILABLE

From Stock and on Short Delivery

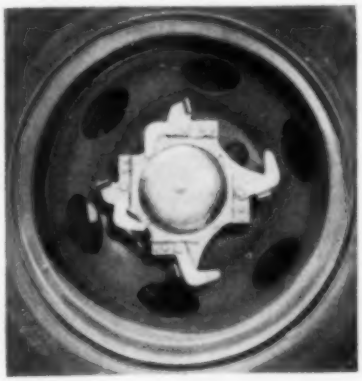
For immediate action on complete information write, wire, or call.

McNALLY PITTSBURG MFG. CORP.

Pittsburg, Kansas Wellston, Ohio

Equipment News *(Continued)*

service equipment and is expected to protect tire tread from cut and rupture damage. Groove cracking, reportedly, has virtually been eliminated. An extra-deep tread on the tire (named the Super Fleetmaster) is designed for more mileage, and wide angle groove construction is engineered to minimize stone retention. In a move to make the tire exceptionally resistant to chipping, snagging and cuts, the tread has been treated with a specially-wrought compound.



Signals Backup Alarm

The Bullard mechanical back-up alarm for trucks is attached to the rear wheels. It operates on gravity only and is independent of the speedometer. Mounted, an alarm sounds when the vehicle is moving in reverse. Four hammers mounted at quarter posts on the unit strike a bell. When the vehicle is moving forward the hammers are held against rubber cushions by centrifugal force. 275 8th St., San Francisco.

Equipment Shorts

MELTS SNOW—A chloride-free ice and snow melting material reportedly harmless to pavements, metals and vegetation is being sold by Speco, Inc., 7308 Associate Ave., Cleveland 9, Ohio. Known as "Ice Rem-CF," the material is said to be 99.9% chemically active and contains neither calcium nor chlorides. Although it produces no heat, "Ice Rem-CF" combines "melting" and abrasive action.

OVERSHOES—Rubber overshoes so wide that they will slip over wide-last safety shoes equipped with steel toe caps are being made by Tingley Rubber Corp., 903 Ross St., Rahway, N. J. Sold under the name "Hi-Top," the overshoes, or rubbers, are made of du Pont neoprene and are designed to withstand contact with oil, grease, acids, chemicals and exposure to sunlight.

HARDSURFACING FLUX — Lincoln Electric Co., Cleveland 17, Ohio, has added H-560, a hardsurfacing agglomerated alloy flux for use with the submerged arc welding process, to its flux line. The flux will produce a high carbon, high alloy weld deposit when used with Lincoln's L-60 mild steel automatic electrode wire. Alloys are added to the weld deposit through the flux. Agglomeration bonds the flux and alloy. Lincoln says a deposit with a hardness of 53 to 61 Rockwell RC is formed.

PUMP PACKAGE—Red Jacket Mfg. Co., Davenport, Ia., is selling a 7 gpm, ½ and ½-hp submersible pump package with 40, 80 and 150 ft of cable attached, control box, air release and gauge, pressure switch, and one-piece air charger. One package (S-40) is suitable for pumping depths from 4 to 40 ft; another, the S-80, for depths from 8 to 80 ft; a third, the S-150, for depths from 15 to 150 ft.

WELDING RODS — Three extruded, heavy coated bronze oxyacetylene welding rods designed for braze welding and welding malleable iron, cast iron, brass and bronze with dirty, oily and greasy surfaces have been announced by Air Reduction Sales Co., 150 E. 42nd St., New York 17, N. Y. The three types—Airco No. 20 bronze rod for general braze welding; No. 22 manganese bronze rod for high strength welds; and No. 27 low fuming bronze rod—are made in four diameters, from ⅛ in to 3/32 in.

Free Bulletins

AIR HOSE—B. F. Goodrich, Industrial Products Co., Akron, Ohio, has published a 2-p bulletin describing its air hose. Featured is Maxecon all-purpose hose for use with air, water, gasoline.

BIT, DRILL SHARPENER—A complete description of the Ex-Cell-O, style 49-A grinder is the subject of a bulletin being distributed by the Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich. Partic-

Multi-purpose Gulf Mining Machine Lubricant can be used in all plain and antifriction bearings, gear drives, crawler mechanisms and transmissions.

No danger of using the wrong grease . . . with

Gulf Mining Machine Lubricant

Use Gulf Mining Machine Lubricant—and you automatically simplify your storage and handling problem! Gulf Mining Machine Lubricant takes the place of 2 or 3 lubricants at the face.

This means an important reduction in costs, and complete elimination of the danger of using the wrong grease.

Gulf Mining Machine Lubricant handles practically all lubrication jobs at the face. It's a multi-purpose lubricant. Gulf Mining Machine Lubricant sticks to gear teeth, resists throw-off . . . keeps out abrasive coal dust, guards against excessive wear and breakdowns. Gives effective protection under wet conditions, too.

For further information, call in a Gulf Sales Engineer. Contact him at your nearest Gulf office.

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GULF REFINING COMPANY
1822 Gulf Building
Pittsburgh 30, Pennsylvania

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

how to make your own mine roof jacks

1. Duff-Norton supplies the head and handle.
2. You supply the pipe to fit your desired height.
3. Add the desired Duff-Norton base and you have the perfect mine roof jack.

Here's all you do—(1) cut any 2-inch standard steel pipe into lengths desired and (2) attach safe, strong, dependable Duff-Norton head, handle and base fittings. That's all!

You choose the type of heads, handles and bases best suited to your particular needs. They are available in a variety of types in both 8 and 16-ton capacities (16 ton requires 2-inch *extra strength* pipe). All fittings are painted light grey for better visibility.

For complete information on Duff-Norton mine jacks, see your local distributor or write the world's oldest and largest manufacturer of lifting jacks for your free copy of catalog AD-10J, "A Handy Guide for Selecting Duff-Norton Mine Jacks." This catalog contains complete information not only on mine roof jacks but other popular Duff-Norton jacks for useful trouble-free service in and around coal mines. Duff-Norton Co., P. O. Box 1889, Pittsburgh 30, Pa.

DUFF-NORTON

"Giving Industry A Lift Since 1883"

Jacks

DUFF-NORTON COMPANY

Equipment News *(Continued)*

ular reference is made to grinding carbid-tipped tools. Bulletin 46661.

MOTOR DRIVES—Worthington Corp.'s bulletin 1610-B1 P illustrates motor drives with positive pulley adjustment in sizes ½ to 25 hp. Feature: selection of variable speed drives to meet specialized requirements. Another bulletin, 1630-B1 P, on variable speed motor pulleys (¼ through ¾ hp) is available from the Advertising and Sales Promotion Dept., Worthington Corp., Harrison, N. J.

SCRAPER—New literature describing the model TS-18 twin-power scraper manufactured by the Euclid Div. of General Motors, Cleveland 17, Ohio, is available by writing for form 552. The literature explains the "twin-power" principle and is illustrated with photos, specifications and a performance graph.

LUBRICATION—Manual and automatic spray lubrications systems for open-gearing and slid surfaces are the subject of Bulletin 60-A, published by The Farval Corp., 3249 E. 80 St., Cleveland 4, Ohio. Schematic layouts and application photos are included.

SMOKE, COMBUSTION CONTROL—The revised Brooke smoke density system using "Brown Electronik" recorders is described in data sheet 10.14-2A by the Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia 44, Pa. The sheet's subject is "Good Combustion Practice."

EARTHMOVING—"Facts," a booklet published by Allis-Chalmers Mfs. Co., Box 512, Milwaukee 1, Wis., contains suggestions on choosing your equipment, maintaining its efficiency, handling earthmoving jobs.

MATERIALS HANDLING, POWER TRANSMITTING MACHINERY—Link Belt Co., Prudential Plaza, Chicago 1, Ill., is distributing a directory (Book 6253) of standard products, engineered equipment, manufacturing, sales and service facilities. A comprehensive guide to the company's products, the book covers such topics as research facilities, chains and sprockets, drives, process machines and conveyors.

INDUSTRY CONTROLS—Bulletin GEA-6334 provides application information on General Electric's "Pan-A-Trol," packaged control panel. The bulletin includes features on engineering assistance, design, installation, maintenance and field service offered by General Electric, Schenectady 5, N. Y.

HEAVY DUTY TRUCKS—The 20-page catalog (CR-674-F) published by International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., has information on four-wheel conventional and cab-over-engine heavy duty trucks with six-

REMOVE MORE MOISTURE FROM YOUR COAL

WITH

SYMONS® V SCREENS

here are 3 reasons why:

1. Force of over 5 times gravity:

Symons V-Screens get appreciably more moisture from fine coal than is possible with conventional screens which depend on *gravity alone* to do the job. V-Screens fully utilize the extra force of centrifugal action . . . a force of more than five times gravity.

2. Full 12 feet of screening surface:

In contrast to conventional dewatering screens, Symons V-Screens uniformly disperse the coal and water to a full 12 feet of screening surface . . . double that of the widest conventional dewatering screen now in use.

3. Easily controlled speed:

Operating speed of Symons V-Screens is easily controlled, enabling operators to vary screening force, bed thickness, length of material retention and capacity to meet varying plant or mine conditions.

It is important to remember that with the more efficient and thorough dewatering obtained with Symons V-Screens you save on thermal drying cost.

● The Symons V-Screen will dewater coal from 1½" down and is ideally suited for dewatering in the ¼" x 0 size range. Experience from actual operations indicates the Symons V-Screen will generally handle from 2 to 2½ times the capacity per square foot of screening surface of conventional type screen.

In addition to dewatering, Symons V-Screens are ideally suited for sizing, de-dusting, de-silting and washing operations.

SEND FOR FREE BULLETIN

Clip and mail the coupon for your free copy of Bulletin 243, which gives the full story on Symons V-Screens.

NORDBERG MFG. CO., Milwaukee, Wisconsin

NORDBERG

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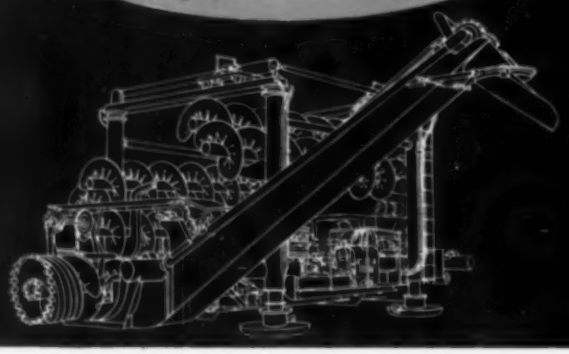
Better RECOVERY *with the Better* AUGER

COMPTON COAL AUGER INCREASES RECOVERY from 35% to 65%



On operation after operation the Compton Coal Auger has shown its ability to increase coal recovery from 35% to 65%. In planned mining where all types of mining, auger, strip and deep, are used the Compton Auger has added greatly to the profitable efficiency of the overall operation—recovering quickly and profitably tons of coal which would be impractical cost-wise to mine by any other method.

Better RECOVERY with the Better AUGER:

Compton's patented non-clogging lump recovery head, which has been copied but never duplicated, cuts coal at high speed giving maximum recovery in record time . . . under favorable conditions as much as 870 tons in a 7¼ hour shift with a 4 man crew.

Better RECOVERY with the Better AUGER:

Developed by the maker originally for his own use the Compton Auger is the successful result of much engineering research plus exhaustive field tests and actual on the job experience. Painstaking effort which reflects in the many Compton Augers now in use profitably recovering tons of coal for their satisfied owners.

For the complete Compton Auger facts and their correct application to your property, call for a Compton sales engineer now. Learn about planned auger mining from the pioneers in this rapidly growing field of mining "lost" coal at a profit.

Compton, Inc.

ORIGINATORS OF COMPTON LUMP RECOVERY HEADS

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CLARKSBURG, WEST VIRGINIA

Equipment News *(Continued)*

cylinder engines. Gasoline, liquefied petroleum gas and diesel powered models are covered.

FLEXIBLE COUPLINGS—Bulletin 203, published by the Lord Mfg. Co., Erie, Pa., describes Lord's flexible couplings with torque capacities from 1/80 to 3500 hp.

EXCAVATOR—Koehring Co., Milwaukee, Wis., has in print a 6-page catalog describing its 25-ton lift, ¾ cu yd dipper capacity, 305 excavator.

BEARINGS GREASE—A high melting point bearings grease for bearings running at temperatures up to 250 deg F is the subject of Sun Oil Co.'s Bulletin 47 entitled "Sun N-52X Grease." Sun Oil, 1608 Walnut St., Philadelphia 3, Pa.

HYDRAULIC SYSTEMS—Mobile equipment, oil hydraulic systems and components is available from Vickers, Inc., Box 302, Detroit 32, Mich., by writing for Bulletin M5101A. Single and double vein pumps, power packs, multiple unit valves, relief valves, reservoirs, fluid motors and power steering boosters are included.

TURBINE PUMP—Layne & Bowler Pump Co., 2943 Bail Ave., Los Angeles 22, Cal., is offering Bulletin 600 containing material on the "Verti-Line" turbine pump, enclosed line shaft pump.

WET ROCK DUSTER—The M-S-A wet dust nozzle and its use with the "Bantam 400" duster is featured in Bulletin 1201-3, published by Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa. How rock dust and water are combined for application in slurry form is included in the text.

GREASE, OIL—"Jet-Lube" multi-purpose greases, outside gear and track roller lubricants, gear oils with moly-disulfide are included in an 8-p catalog being distributed by Jet-Lube Inc., 3093 N. California St., Burbank, Cal.

STOCK LIST—A new stock list covering tool bits, drill rods and ground flat stock manufactured by Firth Sterling Inc., 3113 Forbes St., Pittsburgh 30, Pa., has been released by the company for distribution. Thicknesses, widths, lengths and decimal equivalents are included.

WIRE ROPE ENDINGS—American Chain and Cable Co., Inc., Wilkes-Barre, Pa., has prepared Folder DH-531 on "Dualoc Wire Rope Endings."

FEEDER—Pulva Corp., 550 High St., Perth Amboy, N. J., has announced Catalog 5607 covering its line of "Com-Bin-Feeder." The bulletin features "the solution to feeding non-free-flowing materials."

MOTORS—Two bulletins, GEC-1026A

RUGGED BUTYL INSULATION plus neoprene jacketing gives this ANACONDA Mine Power Cable long life under rugged conditions: 60-ft. drop over rocky cliff, unprotected from sun or weather in northern open-pit mine.

BUTYL INSULATION MEANS LONGER LIFE

This Cable is as tough as the terrain looks!

Experience shows that in high-voltage mine power cable, the insulation must provide not only good ozone resistance but *mechanical strength* as well.

The unusual tensile strength and inherent ozone resistance of Anaconda's butyl insulation means the strongest, sturdiest mine power cable ever offered you.

In addition, this insulation resists heat, moisture and has high dielectric strength. Over the insulation is a tough, abrasion-resistant neoprene jacket—engineered from years of testing in our own mines.

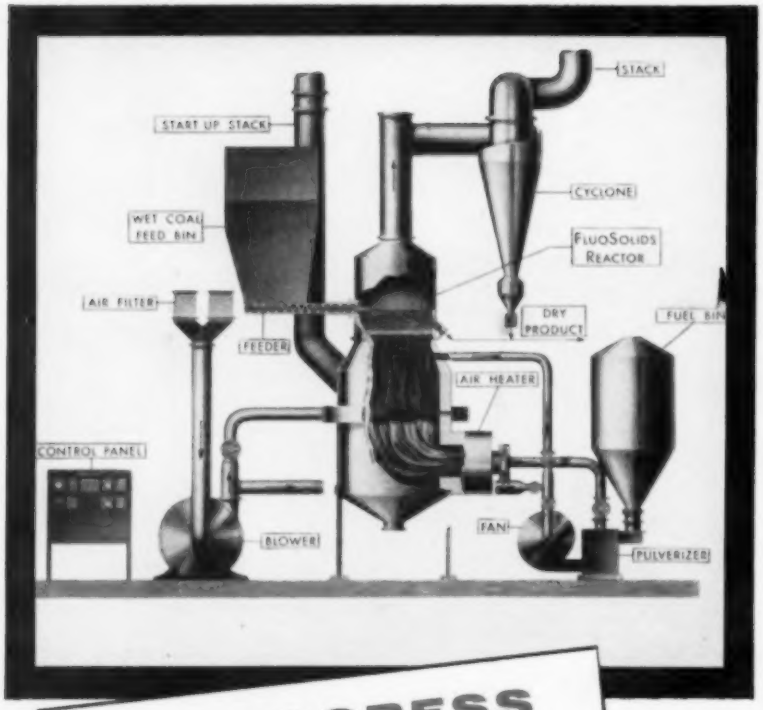
NEW ENGINEERING BULLETIN EB-27 has full details on performance of Anaconda butyl insulation in 15 Industry Specification tests. Ask the Man from Anaconda for your copy as well as more information about ANACONDA Mine Power Cable. Or write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

56331

SEE YOUR ANACONDA®

DISTRIBUTOR FOR MINE POWER CABLE

FLUIDIZED COAL DRYING



A PROGRESS REPORT...

The first Dorrco FluoSolids System for coal drying has been on stream since July, 1955. Operating information is now available to prove conclusively the advantages of fluidization compared with conventional thermal drying of coal. Located at Lynnville Coal Company, Lynnville, Indiana, the System has demonstrated that . . .

Steam Coal and Metallurgical Coal can both be dried successfully. Variations in sulfur from 0.6% to 4% and in inherent moisture from 3% to 9% have no effect on the operation.

Feed variations from 69 TPH to 107 TPH and total moisture variations from 10.1% to 22.4% are easily taken in stride.

Saturated stack conditions have prevailed during majority of operating time with relative humidity of the exit gases never dropping below 90% . . . indicating maximum air utilization and resulting in a clean stack.

100 tons per hour of ¼" x 0 coal is the average being handled and the entire drying system occupies only 1350 sq. ft.

If you'd like more information on this radical departure from conventional fine coal dryers, write for a copy of Bulletin No. 7503. Dorr-Oliver Incorporated, Stamford, Connecticut.

FluoSolids T.M. Reg. U. S. Patent Office

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INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

Equipment News *(Continued)*

and GEC-1027A, give buying information on a selective group of General Electric motors. Covered are fractional horsepower motors, integral horsepower polyphase and single phase induction motors. General Electric Co., Schenectady 5, N. Y.

TORQUE CONVERTERS—Heavy duty, single stage, hydraulic torque converters for transmissions of 100 to 1,000 hp are the subjects of Bulletin 468, published by the National Supply Co., 2 Gateway Center, Pittsburgh, Pa. Seventeen sizes and capacities are listed.

VIBRATION TRACKING—A booklet containing a vibration isolation efficiency curve designed as a guide in selecting flexible mounting systems where control of noise and vibration is wanted, has been printed by the Lord Mfg. Co., Erie, Pa.

BITS, CARBIDE BLANKS—"Long body" bottoming type percussion bits carbide blanks for bottoming drive rods are featured in Catalog V-R 486 distributed by Vascoloy-Ramet Corp., 800 Market St., Waukegan, Ill. Charts showing 19 sizes of the long body bits are included. Also described are bits and blanks for seven types of shoulder drive rods and seven sizes for push-on-rods. Break-away and over-hand style bits are also illustrated.

VIBRATION MONITORING — The Model 5 "Vibraswitch" and its use in protecting rotating equipment against damage in the event of failing bearings or other mechanical malfunctions is described in detail in Bulletin 500-5 distributed by the Beta Corp., Richmond 26, Va.

DRILL BITS—A comprehensive description of Le Roi-Cleveland 1-use drill bits, their construction, specifications and the preparation of drill rod shanks is contained in Bulletin RG-29, Le Roi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.

WELDED CHAIN—Bulletin DH-319, issued by American Chain Div., American Chain & Cable Co., Inc., York, Pa., describes late development in welded chain which is said to resist bending, breaking and kinking in such applications as slings, banding, load binding, towing and boomer chains.

GENERATOR SETS—Detroit Diesel Engine Div., General Motors Corp., 13400 W. Outer Dr., Detroit 28, Mich., offers a new brochure with specifications and illustrations of over 25 radiator and heat-exchanger cooled models on generators from 20 kw to 245 kw, 50 or 60 cycle or DC, for emergency standby and continuous use. Features of two-cycle Detroit diesel engines which operate the sets and automatic starting and shutdown equipment are fully covered.

Treads Going Strong

...after 17 years!

Want to lower your maintenance costs? Then consider the experience of Shasta Coal Company, of Bicknell, Indiana.

Shasta's big shovel, shown here, used to require new treads every 3½ - 4 years. Then, back in 1939 it was fitted with KENSINGTON SUPERMANG treads *. . . and those same treads are still going strong today!*

Cases like this are not unusual. Throughout the coal fields, tough, durable KENSINGTON-built treads are giving many years of bonus service, and thereby saving their owners thousands of dollars in replacement costs.

KENSINGTON engineers have devoted over 25 years to the study of overcoming wear and breakage. They've investigated the working conditions under which treads operate. They've analyzed hundreds of broken treads to discover why they fractured.

This research showed KENSINGTON how to make important improvements in tread design. Supporting ribs were strengthened, other stress-bearing points reinforced. In many cases, roller pathways were widened. This reduced pressure per square inch and thus ended the flow of metal which had caused reverse bending and breakage.

In other cases, KENSINGTON has redesigned rollers, take-up tumblers, and drive sprockets. The result is always the same: *longer service.*

Meanwhile, KENSINGTON metallurgists had perfected ORO SUPERMANG . . . a remarkable alloyed manganese steel which actually *fights back* against wear.

When SUPERMANG is exposed to impact, it develops surface-hardness. This "skin" of extra-hard metal slows wear and abrasion in roller pathways, pin-eyes, and other critical points. Yet underneath this ever-hardening surface, the metal remains tough and able to withstand the impact and stresses which cause ordinary treads to break.

In the rugged Lake Superior iron mining region, for example, thousands of KENSINGTON treads have served under some of the most severe conditions imaginable, yet *none has ever broken or worn out!*

KENSINGTON replacement parts are designed to fit all standard shovels and draglines. Though they can be expected to outwear ordinary parts by many times, cost is about the same as for parts furnished by the equipment manufacturer.

If you are anxious to reduce your maintenance costs during the coming years, you will want to switch to KENSINGTON. Mail the coupon today. You'll be under no obligation.

Completely equipped with *Kensington* treads, this shovel uncovers an average of 500,000 tons of coal yearly for Shasta. Treads installed 17 years ago appear to be good for many more years of rugged service.

Kensington

STEEL COMPANY

Photos taken in 1939 just before tread at right was installed on Shasta shovel. Comparison with manufacturer's tread at left shows wider roller pathway and other design improvements.

KENSINGTON STEEL CO., Dept. C, 505 East Kensington Ave., Chicago, Ill.

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☐ Quote prices ☐ Have representative call ☐ Send literature

MAKE OF SHOVEL OR DRAGLINE _____ MODEL _____

CASTING NO. _____ NO. PER SET _____ OVER-ALL WIDTH _____

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

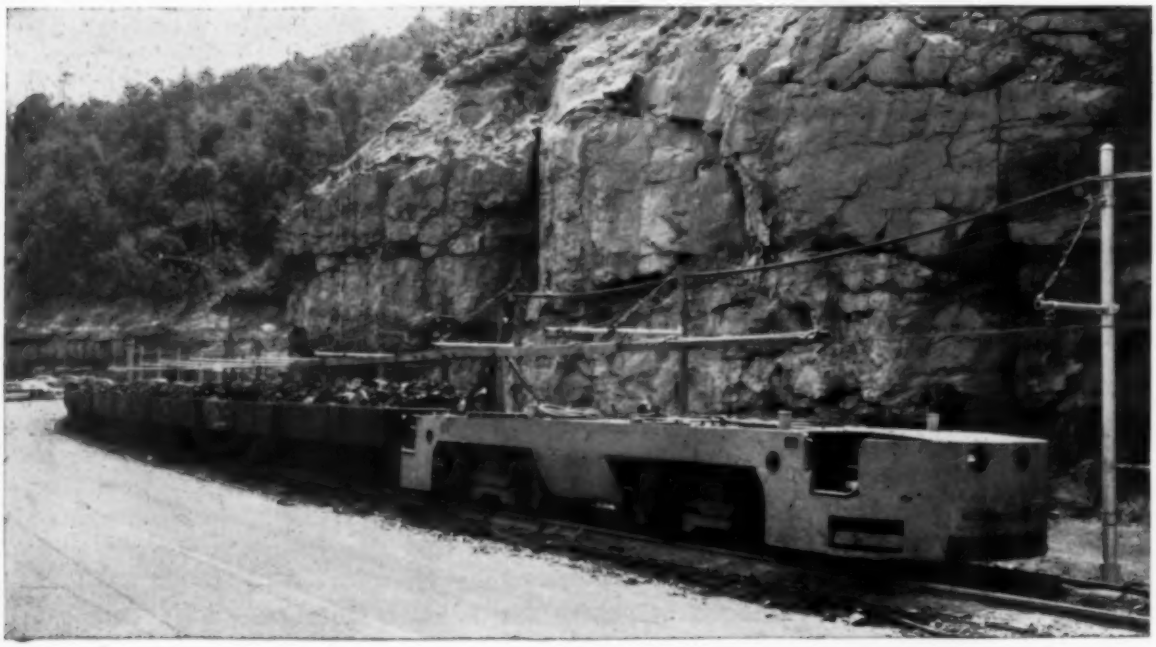
For heavy hauling you'll do better with **JEFFREY** 8-wheel Trolley Locomotives

Big coal loads can be hauled fast with Jeffrey 27, 37 or 50-ton single-unit locomotives.

Operation and maintenance are better, too. The four-wheel, equalized double trucks and the short overhang at the ends give an easy ride at high speed. The eight wheels distribute the locomotive's weight for less concentrated rail loading.

Outstanding operating and safety features include: roller-bearing type journal boxes and motor axle suspensions . . . air and dynamic service brakes . . . automatic couplers with air-operated uncoupling . . . trolley with air-operated retriever . . . separate blower for each motor.

Other features of 8-wheel locomotives and other types for mainline and secondary haulage are described in Catalog 836. For a copy, write to The Jeffrey Manufacturing Company, Columbus 16, Ohio.



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COAL AGE

NEWS ROUND-UP

Ayrshire Coal Will Fire World's Largest Power Unit

Last March after celebrating its 50th year of age, American Gas & Electric charted an expansion program that seemed likely to guide the company in the direction of a centennial (*Coal Age*, April, 1956, p 114). Already the world's biggest privately owned power producer, AGE announced a $700 million program that would add 2.6 million more private power kilowatts by 1960. In all, AGE would be capable of generating a total of 6.6 million kw. Eight stations with capability totaling 1.7 million kw were already under construction or in late drawing-board stages. The construction of stations to generate the remaining 900,000 kw was to be announced.

By May 1, American Gas & Electric had made up its mind what it was going to do (*Coal Age*, June, 1956, p 122). Philip Sporn, its president, disclosed that two 450,000-kw stations would be constructed by the Indiana & Michigan Electric Co., one of the seven utilities scattered in six states that comprise AGE. The site was unchosen, but the importance of the announcement lay in AGE's plan to generate 450,000 kw from each station with single generating units.

Last month, from its New York office, AGE disclosed that the first of the two units would be built on an 875 acre tract of land on the banks of the Wabash River a few miles south of Terre Haute, Ind. The cost would be $58 million. AGE boasted that the unique single generating unit would not only be the largest one operating today (73% larger), but the most efficient.

The utility's connection in coal was with Ayrshire Collieries Corp., an Indianapolis producer that is developing a new mine and six-mile railroad spur at a cost of $4 million. The mine is situated in Ayrshire's 10,000-acre Thunderbird property in Curry township, between the Indiana villages of Shelburn and Farmersburg. The coal company is preparing to supply AGE's new plant with 1.3 million tons annually for a 15-yr period beginning in 1958, the scheduled completion date. The contract between coal producer and power producer also calls for an additional 15-yr extension and for doubling the coal supply in the event that a second 450,000-kw unit is built on the site, a feat that AGE has under consideration. Ayrshire, 16th on the list of the nation's largest coal producers, owns mines in Indiana, Kentucky and Illinois.

James W. Morgan, Ayrshire's president said that development of the mine and construction of the railroad will begin before the end of the year. The six-mile spur will extend west from the mine to the generating plant's riverside coal storage yard and will be tied in with another spur to the Chicago & Eastern Illinois RR.

The new generating plant will be capable of supplying all the residential electric requirements of a city with a population of 4 million. Its site on the Wabash in Indiana, opposite the Illinois bank, was chosen for its proximity to abundant low-cost coal and an abundant water supply. Indiana & Michigan Electric's own total generating capability will be raised by the new plant to 1.4 million kw.

According to Mr. Sporn, the new plant "is the result of design and construction experience" obtained from the super-critical pressure unit nearing completion at AGE's (Ohio Power) plant in Ohio. Babcock & Wilcox Co. will build the boilers for the new unit. As tall as a 23-story building, it will exhaust to a stack approximately 500 ft high. General Electric is building the turbine.

QUEEN ANTHRACITE—Miss Mary Ann Strilka, 19, of Olyphant, Pa. was selected as Queen Anthracite Sept. 2. Judges favored Miss Strilka over 11 other contestants from communities throughout the anthracite region. On the agenda: a ten-week course at the Philadelphia Modeling and Charm School; a trip to New York and personal appearances. A dancing instructor, Miss Strilka is 5 ft 7 in wants to act or model.

Oil Importers Ignore Plea To Reduce Crude Dumping

As oil imports continued to hold at a record level (347,000 bbl per day) despite federal suggestions and warnings to let up, Arthur S. Flemming, director of the Office of Defense Mobilization, last month called anew for a voluntary slowdown. Although the trend of imports shows that Dr. Flemming's requests have been largely ignored, he again sent letters to 50 oil importing companies expressing his "disappointment" at their failure to reduce the flow of incoming crude to the recommended 290,000 bbl a day. In his letter the ODM director reminded the importers that domestic petroleum producers had petitioned for a mandatory curb to protect the industry. Oil producers here are perhaps the most aggressive group opposing the importers. They demand that quotas be imposed under the "escape clause" of the Trade Agreements Act, which provides for quota action when imports threaten to harm a strategic industry. Dr. Flemming warned the importers again, as he has done before, that United States producers had entered a petition

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calling for the mandatory curb and that hearing had been scheduled for a date early this month. He said that importers' failures to cut imports "cannot help but be an important factor in deciding how the petition should be handled." Obviously reluctant to impose hard curbs, Dr. Flemming has fabricated a dilemma for himself: either impose curbs or let oil imports continue to rise.

Meanwhile, the importing companies, in defense of their mounting imports, are preparing an argument to bolster a stand that the ratio of oil imports which ties current shipments to the 1954 level, should be revised.

$2 Miners' Raise Marked By Peaceful Negotiations

A two-step, $2 pay raise for 200,000 bituminous miners was won by John L. Lewis and the United Mine Workers last month during secret negotiations with the Bituminous Coal Operators Association and Edward Fox, chief negotiator. During sessions held in Washington, D.C., the two sides came up with an amicable agreement giving miners $1.20 a day beginning October 1, and $.80 more beginning April 1, 1957. In addition, vacation pay (12 days) was raised from $140 to $180, and miners were granted two more contract holidays annually. As a result of the new pact, miners' salaries, already the highest among the country's major industries, will be $22.35 a day after April 1.

Although the agreement had been negotiated secretly and was subject to revision by the full wage committee of the BCOA, final approval was expected by negotiators on both sides. The accord was seen, also, as a vindication of the recent choice of Mr. Fox as chief labor negotiator for the operators, since the talks had disspelled fears that harmonious relations between Mr. Lewis and coal might disappear with the death last summer of Harry M. Moses. Mr. Fox, however, has had long experience negotiating with Mr. Lewis in the anthracite fields. In fact, it was with this experience in mind that the BCOA selected him for the job of negotiating for the bituminous producers. Last month, Mr. Fox huddled with Thomas Kennedy, a vice president of the UMWA, in preliminary talks. Mr. Lewis took personal charge after returning to Washington from a 10-day vacation in Wyoming. As a result of the successful outcome of the new contract he was able to announce a strike-free triumph at the UMWA convention early this month. The new terms are expected to be acceptable to Southern producers as well.

50 More Liberty Ships Sought by ACSI

As the Maritime Administration last month was considering an application for 30 Liberty ships by American Coal Shipping, Inc., ACSI disclosed that it was asking the government for 50 more vessels from the mothballed fleet. The difference in the newest request lay in the basis of acquirement. Last summer, in its request, for 30 Libertys, ACSI sought them on a charter basis. This time it seeks to act as a general agent. The ships would be operated for government account with ACSI acting as agent and assuming no risks. The request seemed designed to cut away the clutter of stipulations that had

Preparation Facilities

Christopher Coal Co., Humphrey No. 7 mine, Maidsville, W. Va.—Contract closed with the Deister Concentrator Co. for eight SuperDuty diagonal deck No. 7 coal washing tables to clean ⅜x0 fraction; one Model 108-B Concenco revolving feed distributor for feed distribution to the SuperDuty tables.

Roy E. Blyler, Good Springs, Pa.—Contract closed with the Deister Concentrator Co. for one No. 7 SuperDuty diagonal deck coal washing table to clean No. 4 and No. 5 buck size anthracite.

Eastern Gas & Fuel Associates, Stotesbury No. 10, Helen, W. Va.—Contract closed with Industrial Engineering & Construction Co., Inc., for a fine coal cleaning plant to clean 150 tph of ⅜x0, using stump airflow boxes. A Cyclone dust collecting system will be installed. Completion, early 1957.

Amherst Coal Co., Rensford, W. Va.—Contract closed with the Kanawha Mfg. Co. for a fine coal recovery system comprising a three-cone, 14-in diameter Heyl & Patterson cyclone unit, desliming screen for cyclone underflow, and necessary tanks and pumps for completing the circuit. Recovered solids to move to existing Reineveld centrifugal dryer.

Amherst Coal Co., Lundale, W. Va.—Contract closed with the Kanawha Mfg. Co. for a fine coal recovery system comprising a three-cone, 14-in diameter Heyl & Patterson cyclone unit, desliming screen for cyclone underflow, and necessary tanks and pumps for completing the recovery circuit.

Christopher Coal Co., Humphrey No. 7 mine, Maidsville, W. Va.—Contract closed with the Deister Concentrator Co. for 24 SuperDuty diagonal deck No. 7 coal washing tables and two Model 108-B Concenco revolving feed distributors for feed distribution to the SuperDuty tables.

Blaschak Coal Co., Mahanoy City, Pa.—Contract closed with the Deister Concentrator Co. for three SuperDuty diagonal deck No. 7 coal washing tables for No. 2, No. 4 and No. 5 buck size anthracite.

Amigo Smokeless Coal Co., Wyco, W. Va.—Contract closed with the Link-Belt Co. for a heavy media coal washing plant.

Bird Coal Co., Bird No. 3 mine, Riverside, Pa.—Contract closed with Roberts & Schaefer Co. for a Hydrotator process. Production rate: 50 tph of 1½x⅜. Equipment is an addition to the present plant. Completion date, July, 1956.

Rochester & Pittsburgh Coal Co., O'Donnell mine, Four States, W. Va.—Contract closed with Roberts & Schaefer Co. for Super-Airflow equipment to process 60 tph of 5/16x0. Completion date, October, 1956.

Berwind-White Coal Mining Co., Maryland No. 1 mine, St. Michael, Pa.—Contract closed with Roberts & Schaefer Co. for Super-Airflow equipment to process 100 tph of ¾x0. Completion date, September, 1956.

Columbia-Southern Chemical Corp., Midvale mine, Midvale, Ohio—Contract closed with Roberts & Schaefer Co. for Super-Airflow equipment to process 60 tph of ⅜x0. Completion date, October, 1956.

Clinchfield Coal Corp., Splash Dam mine, Splash Dam, Va.—Contract closed with Roberts & Schaefer Co. for Super-Airflow equipment to process 112 tph of ½x0. Completion date, November, 1956.

Bird Coal Co., Bird No. 2 mine, Krings, Pa.—Contract closed with Roberts & Schaefer Co. for heavy media, 115 tph for 6x⅜, and for Super-Airflow equipment to process 130 tph of ⅜x0. A complete new plant. Completion date, March, 1957.

C. H. Mead Coal Co., East Gulf mines Nos. 2 and 3, East Gulf, W. Va.—Contract closed with Roberts & Schaefer Co. for Super-Airflow equipment to process 140 tph of ½x0. Completion date, November, 1956.

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accompanied an examiner's August approval of the first request. In the approval examiner C. W. Robinson had recommended that ACSI get its ships, but draped the approval with obstacles that neutralized the favorable recommendation: e.g. 1) a 1-yr charter in place of an indefinite charter, 2) minimum transport rates fixed by the Maritime Administration, 3) permission to haul only coal, returning to the United States empty, 4) payment by ACSI of the cost of breaking out the Libertys (about $150,000 a ship).

Today, ACSI points out that there is a Suez Canal crisis, Europe is facing a huge coal shortage, Belgian coal mine output has been reduced drastically by reduced manpower, and Poland, an important exporter in previous years, has stopped shipments outside Iron Curtain countries. These facts will be the basis of arguments by ACSI for its request for an additional 50 vessels.

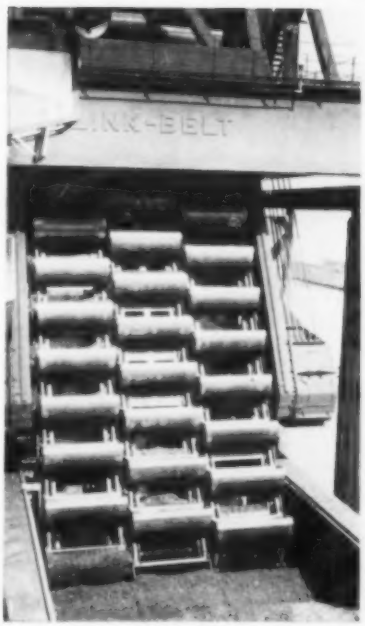
ICC Blocks Rail Attempt To Boost Demurrage Rates

A railroad proposal for a sharp increase in demurrage charges on freight cars has been temporarily blocked by the Interstate Commerce Commission. Responding to more than 470 protests against the proposal, the ICC directed the railroads to maintain present demurrage charges until at least March 31. The Commission said that within that time it would investigate the reasonableness of the proposal.

In July the railroads sought to increase demurrage to $4 for each of the two days after expiration of traditional free time, to $7 for each of the following two days and $10 for each subsequent day that a car was detained by a shipper or freight receiver. The present rates were established in 1949 and permit charges of $3 for each of the first four days after free time and $6 for each day thereafter. Saturdays, Sundays and holidays are not counted, but would be under the new bill. Rails proposed the change for two reasons: (1) Relief for a continuing freight car shortage by prodding slow loaders and unloaders; (2) To meet increased costs of car ownership and maintenance. Leading the protest against the demurrage bill last month was the National Industrial Traffic League, a group composed of the nation's major shippers. The League argued that an increase, such as the one proposed by rails would raise demurrage costs nearly 300%.

Clairton Works Installs Continuous Coal Unloader

U. S. Steel's Clairton (Pa.) Works, situated on the Monongahela River has replaced its unloading riverside coal hoists with a continuous coal unloader. The unloader reaches to the river and extends 100 ft above ground level. U. S. Steel says the unit adds mixing capacity and barge unloading speed to its coke and coal chemical plant. To David P. Finney, general superintendent of Clairton, the unloader's 141 conveyor loader buckets mean more unloading performance and improved uniformity in U. S. Steel's coke. Three continuous bucket lines lift the coal from barge to plant where crushing facilities are capable of reducing it to a 3-in maximum. Then the coal moves on to a 453-ft conveyor and to one of four 1500-ton mixing bins. Thompson - Starrett Co., Inc., built the unloader.



Niagara Mohawk to Build 400,000-kw Steam Plant

New York's Niagara Mohawk Power Corp. is planning to construct a huge $75 million steam generating plant near Buffalo. Larger than the Schoellkopf Station, recently destroyed by a rock slide close by Niagara Falls, the new plant would be capable of generating a capacity of 400,000 kw. Niagara Mohawk's administrative vice president, Charles J. Wick, says that a site has not yet been chosen. Construction, however, has already been determined. The new plant will be equipped with two steam electric generating units, each with a 200,000 kw capacity. The first is scheduled to be put into service next year, the second in 1958. Both units will boost Niagara Mohawk's steam generating output to 2,665,000 kw.

Company Formed To Triple Aluminum Production Goal

The Olin Mathieson Chemical Corp., which disclosed in January that it was planning to become the nation's fourth primary aluminum producer (capacity, 60,000 tons annually), announced formation last month of, Olin Revere, an aluminum producing company owned jointly with Revere Copper & Brass, Inc. The two companies have backed the new venture (Value: $231 million) in the expectation of producing 180,000 tons of aluminum a year. New production plans hold to Olin Mathieson's original intention to construct a reduction plant on the Ohio River near Clarington, Ohio. A new power subsidiary wholly owned by Olin Revere, will be formed. It will operate two 225,000 kw generating units at Cresap, W. Va., across the Ohio River from Clarington (*Coal Age*, March, 1956, p 85). A third 225,000 kw unit, owned by the Ohio Power Co., a subsidiary of American Gas & Electric Co., will occupy the same site when completed in 1958. Pittsburgh Con-

solidation Coal Co. will supply fuel directly from mines at the site at Cresap. In August Pitt-Consol disclosed it would be building a $25 million carbonization plant at Cresap to produce char to feed the nearby power station.

News Briefs

Atomic authority, Louis Roddis, predicts "construction within perhaps 10 to 15 yr" of nuclear power plants competitive with the most "modern conventional plants." Mr. Roddis, who is deputy director of the Atomic Energy Commission's Reactor Development Div. made the prediction during an address before the Ohio Conference on Peacetime Uses of Nuclear Energy and Radiation Safety in Columbus, Ohio. He believes that by 1970 nuclear plants will be producing 25 million kw of about 8% of the total electric power capacity. He says, however, that all nuclear power of 1970 will be economic. But, he adds, by 1975 "we foresee that another 55 million kw of nuclear capacity will be installed, making a total of 80 million kw at that time, raising the share of the total to nearly 20%. The 1975 additions for the most part will be competitive in cost."

In Logan W. Va. one of the state's oldest continuously-operated mines reopened last month after being closed since 1954. Owned by the Norfolk & Chesapeake Coal Co., the Wilson mine had been operated from 1904 to 1954. Completely mechanized now, it has a new tipple and coal preparation plant. John B. Hughey, executive vice president, says production will be about 700 tpd.

E. O. Wagner, Bureau of Mines chemical engineer at Denver, Colo., has received the largest cash award for superior performance ever granted an individual by the U. S. Dept. of Interior. Mr. Wagner received $1,250 for devising experimental equipment used in pilot plant operations of the USBM. Fred A. Seaton, Secretary of the Interior, made this comment: "As a key man in the construction of pilot plants for drying lignite . . . you were responsible for upgrading its heating value and for developing safe operating techniques so successfully that they permitted the design and construction of nine commercial units at Rockdale, Tex., each to dry 1,000 tons of lignite a day instead of the former 5 tons." Mr. Wagner's work, in fact, saved the government $25,000.

The hard-pressed coal industry of Washington state is facing a further decline in its markets, with natural gas now piped into the area from New Mexico for the first time. Indicative of the trend, the University of Washington and two state institutions, Eastern State Hospital and Lakeland Village, have announced they will partly convert to natural gas for heating purposes. As a result, coal mines in the Cle Elum area will lose orders for 27,000 tons of coal annually, effective next year.

The Tennessee Valley Authority has awarded major contracts for three new generating units for delivery at two of its steam plants. One of the units will be delivered to the Gallatin, Tenn., plant, the other to the Johnsonville, Tenn., plant. Total generating capacity is 575,000 kw. The Gallatin unit is the fourth to be installed there. Its capability will be 275,000 kw. Westinghouse Electric Corp. is building the turbo generator for $6,050,000. The steam generating unit will be manufactured by Combustion Engineering Co. for $5,073,530. The two Johnsonville units will increase the total number to 10. General Electric is furnishing the turbo generators (each 150,000 kw) for $6,819,660. Foster Wheeler Corp. is building the steam units for $4,550,085.

The U. S. Bureau of Mines has salvaged thousands of dollars worth of coal, formerly discarded as waste in Washington and Alaska, as a result of pilot plant tests at the USBM's northwest experiment station, Seattle, Wash. Marketable coal has been extracted from waste during experiments with the dense medium process.

Mining operations at the Little Dog mine, Gillespie, Ill., were resumed last

19th Annual Joint Meeting
ASME, Fuels Div., and AIME Coal Div.

Thursday and Friday, October 25 and 26, 1956 at the Sheraton Park Hotel, Washington, D. C. Registration 8:30 am Thursday; first technical session at 10 am.

THURSDAY AM SESSION

W. S. Major, Dravo Corp., and Glynn Coryell, NCA, co-chairmen. Topics and speakers: **Recent Development in an Expanding Spreader Stoker Field,** by F. Guy, Detroit Stoker Co; **Effect of Atomic Energy on Future Use of Fossil Fuels,** by Dr. R. C. Dalzell, AEC, and Harry Perry, BCR; **Determination of Heat Content of Coal by Regression,** by R. L. Pasek, Northwestern University, and R. M. Lundberg, Commonwealth Edison Co.

LUNCHEON MEETING, THURSDAY

Dr. L. C. McCabe, Resources Research, Chairman; Joseph W. Barker, president, ASME, speaker.

THURSDAY PM SESSION

Government Development and Research Activity in Solid Fuels, by T. Reed Scollon and Harry Perry, USBM; **Underground Gasification,** by C. A. Masterson, British Ministry of Fuel; **Coal Industry Research,** by James R. Garvey, BCR; Percy Nicholls Award will be presented to Chester A. Reed by Carl T. Hayden at the annual banquet on Thursday.

FRIDAY AM SESSION

J. F. Barkley, USBM and Herbert G. Bryan, Potomac Naval Command will be co-chairmen; **Fly-Ash Firing,** by E. C. McMann, Public Service Electric & Gas Co; **Combustion Symposium**—Norman D. Phillips, Babcock & Wilcox; Alexander Bogot, Combustion Engineering, Inc; and F. J. Ceely, Foster Wheeler Corp.

FRIDAY PM SESSION

Coal as a Source of Power for Aluminum, by F. G. Feeley Jr., Olin Mathieson Chemical Corp; **Industrial Fuel Utilization in the U. S.,** by W. A. MacFarlane, National Industrial Fuel Efficiency Service; **Changing Market Pattern for Solid Fuels,** by George Lamb, Pittsburgh Consolidation Coal Co.

Mrs. A. Wiley Sherwood, chairman, women's activities, reports that a group of events has been scheduled. Included are a tour of Rock Creek Park, views of embassies, the Episcopal cathedral and lunch at Normandy Farms. Friday activities include a tour of Washington, Georgetown, Arlington Cemetery, Lee Mansion and Lincoln Memorial, a luncheon and fashion show at the Shoreham Hotel and tea at the Pakistan Embassy.

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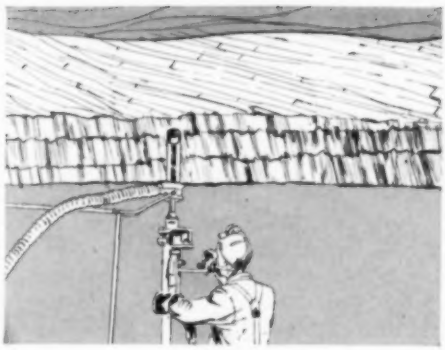

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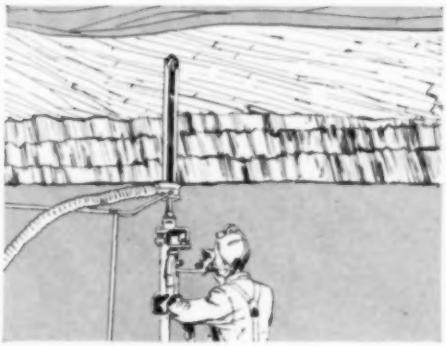

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The Carboloy APT is specially designed as a starting bit. It costs less than solid-type bits, yet its extra-long carbide tips penetrate soft shale, head coal, and limestone faster. It eliminates rifled holes, and provides more clearance for initial insertion of the bolt.

The Carboloy PTH is designed to cut through more abrasive materials such as limestone, sandstone, and stratified formations. Tipped with the hardest, most wear-resistant carbide ever used in the field, this high thrust bit will produce clean, straight, on-size holes, and maintain gauge.

Both the Carboloy APT and PTH are made for easier regrinding, and more regrinds per bit. Used as a team, these bits will bring substantial reductions in operating expense and maintenance costs.

You'll find large stocks of these roof-bolting bits – plus all the other tools in the complete Carboloy line – at your nearby Authorized Carboloy Mining Tool Distributor. Contact him today (his name is listed on the opposite page), or write: *Metallurgical Products Department of General Electric Company, 11120 E. 8 Mile Ave., Detroit 32, Michigan.*

CARBOLOY
CEMENTED CARBIDES

*Carboloy is a trademark of the General Electric Company

News Briefs *(Continued)*

month. The mine had been idle since April when a fire destroyed its hoisting room.

Koal Krudes, Inc., expects its first coal-char plant (Red Lodge, Mont.) to begin producing char by January. Copper and zinc smelters in the Pacific northwest are prospective purchasers. The char plant will also turn out creosote, coal tar and road oil. The char has been tested successfully by the Anaconda Co. sponge iron plant and the American Smelting and Refining Co. smelter at East Helena, Mont. The $200,000 plant will produce 30,000 tons of char annually. Its producing process, adapted to Montana's bituminous coals, was perfected by Dr. Lloyd Berg, head of the chemical engineering department of Montana State College, Bozeman.

The East Boston Coal Co., Pringle, Pa., has ceased production after 91 yr. The company announced that the Pringle coal supply had been exhausted. The operation was developed by W. E. Payne and his son, W. T. Payne, in 1865.

Forty-six western railroads are asking the Interstate Commerce Commission for a freight rate increase that is expected to range between 5 and 10% above current rates. Harry C. Barren, chairman of the executive committee of the Western Traffic Assn., says the higher schedules may be sought jointly by the western carriers and by five major eastern roads, which already have served notice for a fair increase. Meanwhile, southern carriers are undecided whether to ask for an increase or not. The nation's railroads won a freight rate increase ranging from 5 to 6% last March. But railroads are still disappointed with profits in view of the present business boom.

Captained by Nick Erro, the Renton mine, National Mines Corp., won first place in the fourteenth annual Pennsylvania State Bituminous First Aid Contest in Johnstown, Pa., Sept. 8. The Renton team posted a score of 99.867% and was awarded a Mine Safety Appliances trophy, plus $350. Second place and a UMWA trophy plus $175 was won by the Emerald Coal & Coke Co., Allison Ovens team, captained by William Charles. Emerald's score was 99.800%. Pittsburgh Consolidation Coal's Westland mine scored 99.669% to be awarded third place, a National Coal Association trophy and $140.

Two deep well pumps with a combined capacity of 10,000 gpm are being installed in the Delaware Pine Ridge mine, Hudson Coal Co., as part of a $17 million mine drainage program being financed in Pennsylvania by federal and state funds. A second pumping project will be installed at the Glendower mine, Reading Anthracite Co., 8 mi from Pottsville, Pa. The cost of both projects is expected to reach $500,000. Accumulating water in the Delaware Pine Ridge mine is endangering active mines nearby. Delaware Pine Ridge, itself, was shut down several years ago because of high pumping costs. Glendower also inactive, is endangering two nearby active mines employing 500

COAL MEN ON THE JOB . . .

JOANNE COAL CO., Rachel, W. Va.—Harold Parrish (left), superintendent; and Horace Christener, maintenance foreman, at an in-between shift meeting in the Joanne mine office.

Carboloy Mining-Tool Distributors

Your local Carboloy Mining-Tool Distributor is listed below. His complete stocks guarantee you *immediate* local delivery.

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Denver 17—Mine & Smelter Supply Co.

ILLINOIS
Mt. Vernon—Central Mine Supply Co.

INDIANA
Terre Haute—The Mine Supply Co., Inc.

KENTUCKY
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Harlan—Kentucky Mine Supply Co., Inc.
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Pikeville—Big Sandy Electric & Supply Co., Inc.

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Buffalo 23—Austin Ford Logan, Inc.

OHIO
Cambridge—Cambridge Machine & Supply
Steubenville—Voto Manufacturers Sales Co., Inc.

OREGON
Portland—J. E. Haseltine & Company

PENNSYLVANIA
Johnstown—General Electric Supply Co., Div. of General Electric Distributing Corp.
Pittsburgh—General Electric Supply Co., Div. of General Electric Distributing Corp.
Washington—Fairmont Supply Co.

TENNESSEE
Knoxville—Crowell Engineering & Sales Co.
Knoxville—W. J. Savage Company

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El Paso—El Paso Saw & Belting Co.
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UTAH
Salt Lake City 1—Mine & Smelter Supply Co.

VIRGINIA
McClure—Erwin Supply & Hardware Co.

WEST VIRGINIA
Bluefield—Bluefield Supply Co.
Bluefield—Rish Equipment Company
Charleston—Rish Equipment Company
Clarksburg—Rish Equipment Company
Fairmont—Fairmont Supply Company
Montgomery—Marathon Coal Bit Co.
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CARBOLOY
CEMENTED CARBIDES

Snap-on TORQOMETERS

Check roof bolt tension safely-accurately

Roof bolt tension is an important detail affecting the safety of workers. Here's how Compass Coal Co., Philippi, W. Va., double checks bolt-tightening equipment with *Snap-on* Torqometer wrenches at their Deep Mines 1 and 2.

A four-man crew follows the loading crew and installs six bolts on 4-ft centers. Average bolting time is 20 min per place. All bolts are installed with 6 x 6 x ⅜-inch bearing plates and tightened to a torque of approximately 150-ft-lb.

To insure continuous security of roof structure, daily checks are made with *Snap-on* Torqometer wrenches and proper tensions maintained if necessary.

Yes, *Snap-on* Torqometer wrenches are the answer where accuracy and safety are important. They're as easy to handle as ordinary wrenches; simple, too — even the most inexperienced worker can hit specified bolt torque every time. Big, easy-to-read dials measure torque with hairline accuracy. What's more, readings are consistent . . . not affected by the way wrench is held.

Snap-on Torqometers are built in numerous dial-reading and indicating models — capacities from 0 to 30 in.-lb up to 4,000 ft-lb. *Snap-on* is ready to serve your requirements with a complete line of 4,000 hand and bench tools. Write for new 108-page *Snap-on* catalog.

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News Briefs *(Continued)*

men and producing 4,000 tpd, two pumps with 3,000 gpm will be installed.

A Brooklyn restaurant, Gage and Tollner, has been grilling seafoods, steaks, chops, with anthracite since 1879, four years before the Brooklyn Bridge was open. The grills consume 10 tons of egg coal each month.

Hutchinson mine, Westmoreland Coal Co., Hutchinson, Pa., captured first place in the Westmoreland County Safety Association Ninth Annual first aid contest. Hutchinson scored 99.34% to win a Mine Safety Appliances plaque and $210. The team was led by Nick Maruschak. Second place was won by the Loyal mine, Seanor Coal Corp., Saltsburg, Pa. Lead by George Cimbree, Loyal mine posted a 99.333% score to win a National Coal Assn. plaque and $175. No. 10 mine of the Delmont Fuel Co., Hunkers, Pa., was third with 99.200 and received a UMWA plaque and $140. It was captained by John Barbonish.

Bituminous Output

YEAR TO DATE	PRODUCTION
Sept. 15, 1956	349,230,000
Sept. 17, 1955	320,180,000

1956 output 9.1% ahead of 1955.

A month earlier output was 9.8% above 1955.

WEEK ENDING	PRODUCTION
Sept. 15, 1956	10,650,000
Sept. 17, 1955	9,915,000

Anthracite Output

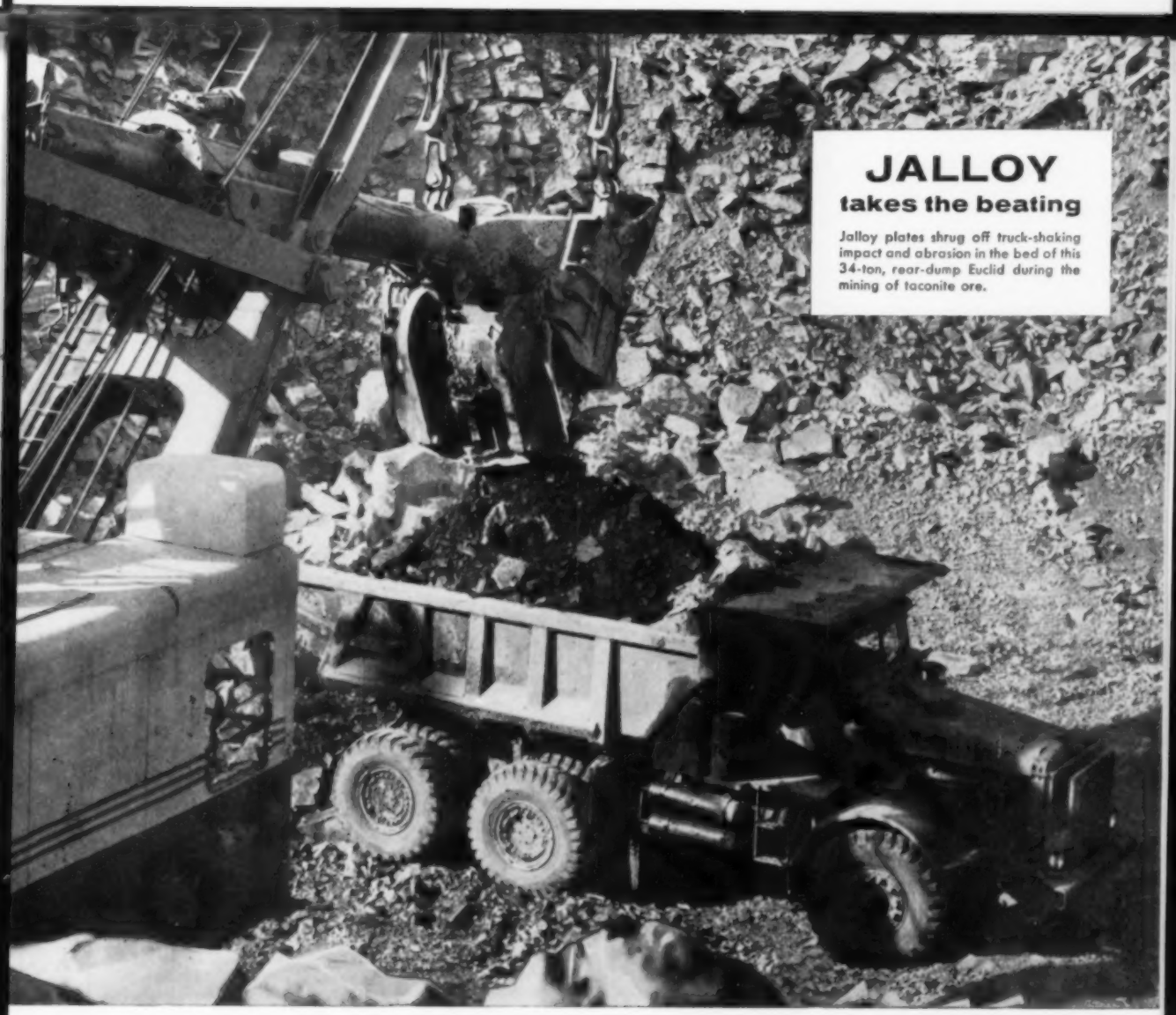
YEAR TO DATE	PRODUCTION
Sept. 15, 1956	19,410,000
Sept. 17, 1955	17,978,000

1956 output 8.0% ahead of 1955.

A month earlier 1956 output was 5.8% ahead of 1955.

WEEK ENDING	PRODUCTION
Sept. 15, 1956	655,000
Sept. 17, 1955	595,000

Montour No. 10 mine, Pittsburgh Consolidation Coal Co., Library, Pa., was first in the Southwestern Pennsylvania Safety Association first aid contest in Waynesburg, Pa. Merle Olsen lead the Montour team to a 99.533% score. A Mine Safety Appliances plaque, a UMWA trophy and $210 were presented to the winners. Allison Ovens, Emerald Coal and Coke Co., Pittsburgh, Pa., was second with 99.267%. The team



JALLOY
takes the beating

Jalloy plates shrug off truck-shaking impact and abrasion in the bed of this 34-ton, rear-dump Euclid during the mining of taconite ore.

Jalloy heat treated steels . . .
cut maintenance—give longer wear life

Jalloy—special purpose steels that are heat treated to provide longer wear on applications where impact and abrasive conditions are severe—last 4 to 20 times longer than conventional mild steels. Furthermore, they are easily welded.

Jalloy is available in three grades:

No. 1—for applications requiring excellent formability or where a low carbon alloy steel possessing good physical properties before or after heat treatment is specified. This is an ideal carbonizing grade.

No. 3—a general purpose steel capable of being heat-treated to excellent physical properties. Compared to ordinary mild steels it offers good resistance to abrasion or wear in the as-rolled state; but when heat treated to Brinell 340 and above, optimum abrasion and impact resistance is secured.

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Jalloy high strength steels are available as plates, structurals, bar and small shape sections, hot rolled sheets, as well as strip and wire products.

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News Briefs *(Continued)*

and its captain, William Charles, was awarded $175. U. S. Steel's Robena mine, Queensboro, Pa., was third with 99.200%. It was awarded $140. J. Cappellini was captain.

A survey of competitive fuel costs in 79 cities in 25 states has shown coal to be on "very firm ground" as a choice of fuels in schools, hospitals and industrial plants, Carroll F. Hardy, Director of the Market Promotion Dept. of the National Coal Association, told the annual meeting of the American Retail Coal Association at French Lick, Ind., Sept. 12. "Vulnerability of coal consuming plants to conversion to the fluid fuels increases as the size of the plant decreases," Mr. Hardy said. This is because the bigger coal consumers, such as electric utilities, usually maintain engineering staffs which evaluate fuel costs.

Coal wins out under such careful scrutiny, as shown by the NCA study of steam-electric fuel consumption and costs in 1955. In competitive areas 85% of the Btu's used by utilities was provided by coal. Average 1955 coal cost per million Btu was 25.2c; natural gas, 23.6c; and oil, 35.7c. Mr. Hardy said that in 1956, oil probably will lose more ground as it is higher priced and scarcer than in 1955.

The recent survey shows that by choosing oil in preference to coal, the cost is raised $7.27 per equivalent ton,

MEETINGS

Central Advisory Council, The Mining Electro-Mechanical Maintenance Association; 4th Annual Meeting, Oct. 6, Mountain View Hotel, Greensburg, Pa.

ASME-ASLE Lubrication Conference; Oct. 8-10, Chalfonte-Haddon Hall, Atlantic City, N. J.

Anthracite Conference; Oct. 18-19, College of Mineral Industries, Pennsylvania State University, University Park, Pa.

ASME, Fuels Div., and AIME, Coal Div.; 19th Annual Joint Meeting, Oct. 25-26, Sheraton Park Hotel, Washington, D. C.

Illinois Mining Institute; 64th Annual Meeting, Oct. 26, Hotel Abraham Lincoln, Springfield, Ill.

Central Appalachian Section, AIME, and W. Va. Coal Mining Institute; Nov. 2-3, Greenbrier Hotel, White Sulphur Springs, W. Va.

Kentucky Mining Institute; Annual Meeting, Nov. 8-9, Phoenix Hotel, Lexington, Ky.

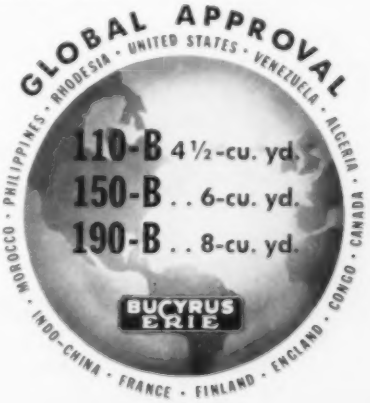
In OHIO . . . and the World Over
IF IT'S HIGH OUTPUT YOU WANT
IT'S BUCYRUS-ERIES YOU NEED

This Bucyrus-Erie 150-B shovel is loading unshot coal, 7½ cu. yd. at a bite, from a pit near Lexington, Ohio. It is equipped with a special coal loading dipper.

Coal mines everywhere, like this one near Lexington, Ohio, are helping protect their profit margins with Bucyrus-Erie shovels. Mine operators know that the sustained high output so essential to consistently high production is yours with Bucyrus-Eries.

Check the design and construction advantages of these modern loading shovels and you'll see why they are top producers in mines everywhere. Outstanding front-end design keeps a high percentage of "up front" weight inside the dipper where it pays. The two-piece boom is exceptionally strong yet light in weight. Crowd machinery is mounted on the revolving frame, not on the boom. Result: power swings more payload, less deadweight.

When selecting loading shovels, if you consider output, cost and length of life, you will look into Bucyrus-Erie Ward Leonard electric excavators first! 93L56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110-B 4½-cu. yd.
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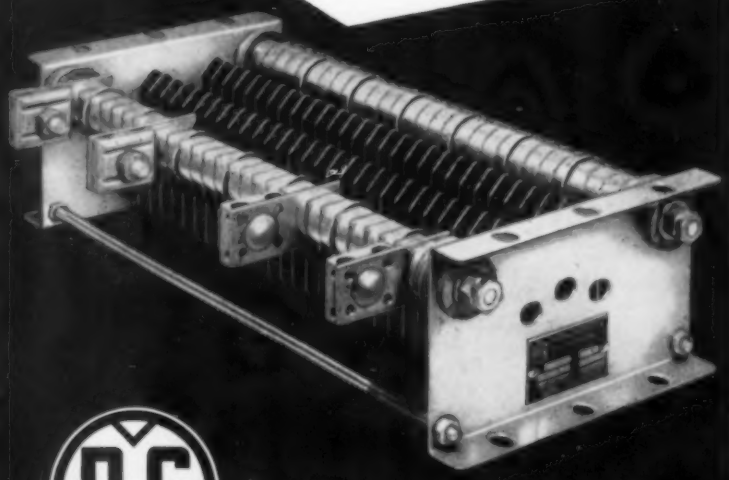
There is a *difference* in Resistors



P-G Resistors have proved this for many years

Different, because steel and mica, both extremely durable materials, coupled with P-G exclusive design produce a resistor of great mechanical strength. There is nothing to break. With accurate resistance values and adequate carrying capacities, P-G Resistors outlast ordinary resistors. Tell us your specifications and let P-G solve your resistor problem.

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News Briefs *(Continued)*

and that selection of natural gas over coal increases the fuel cost $6.08 per equivalent ton.

"If you are interested as a taxpayer in what fuel costs mean in your city," Mr. Hardy stated, "the average saving by using coal is easy to calculate. Multiply the total coal used by schools and other institutions (or its equivalent) by $7.27. This shows the saving over oil. Multiplying by $6.08 gives the saving over gas."

Thieves broke into the Boissevain, Va., offices of the Pocahontas Fuel Co., September 13, burned a hole in the steel vault with an acetylene torch and stole

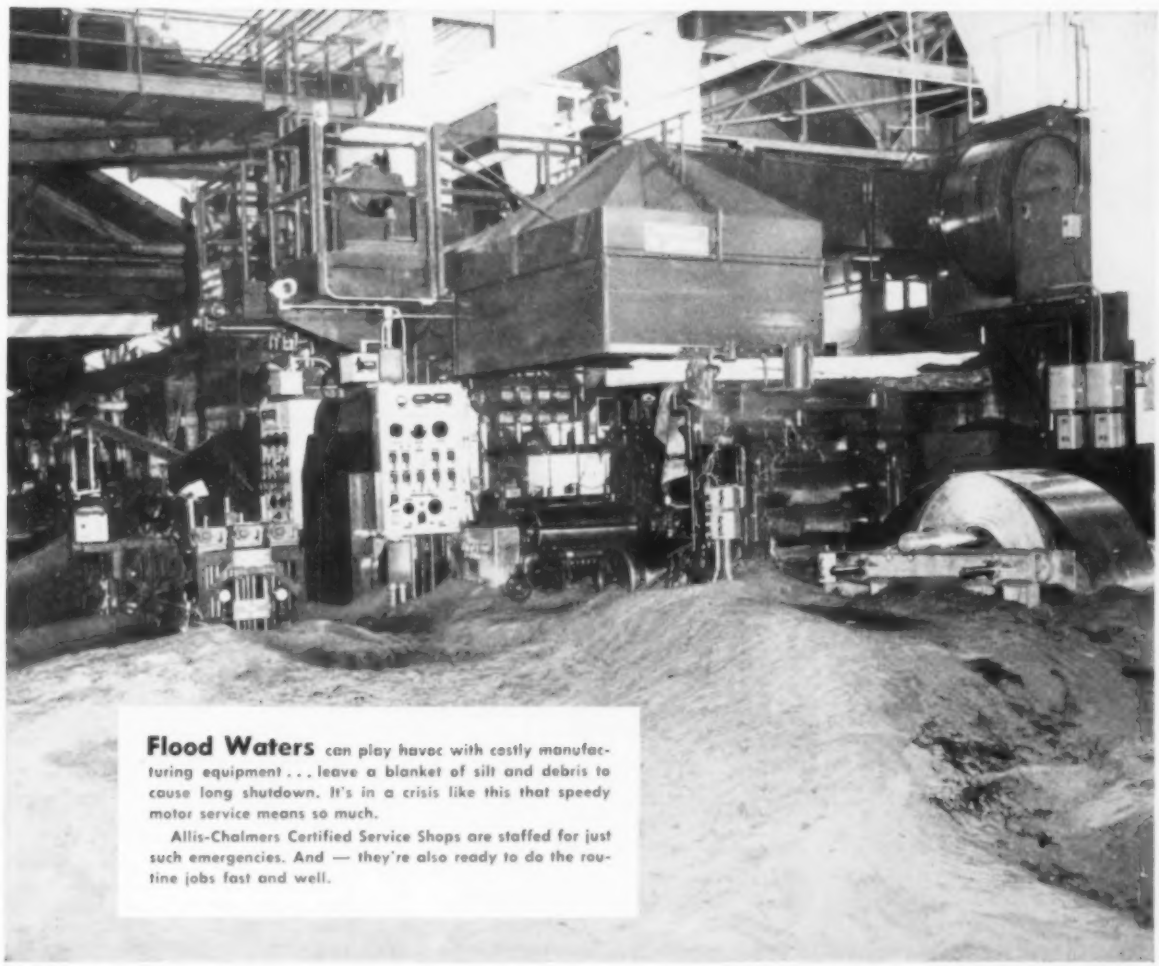
JEWELRY FROM ANTHRACITE, designed by Le Beau of New York, now is being sold by Anthracite Information Bureau, 342 Madison Ave., New York. New items in the line of anthracit-and-sterling accessories include a pendant necklace and matching bracelet, a woman's ring, earrings, cufflinks and tie bar. AIB reports a growing demand and set up a separate department to handle sales. The ring is $5.95; other items are $4.95.

$29,904.63. The money was the weekly payroll in individual envelopes for 210 employees at the company's Boissevain mines. At last reports, the thieves were still at large.

Anthracite Institute, United Mine Workers and anthracite-region railroad officials urged the Federal Power Commission to reject the proposal of the Scranton-Spring Brook Water Service Co. to bring natural gas to the company's Scranton and Wilkes-Barre divisions. The water company, now distributing manufactured gas, argues that

Allis-Chalmers "Certified" Service Shops:

When you need motor help



Flood Waters can play havoc with costly manufacturing equipment . . . leave a blanket of silt and debris to cause long shutdown. It's in a crisis like this that speedy motor service means so much.

Allis-Chalmers Certified Service Shops are staffed for just such emergencies. And — they're also ready to do the routine jobs fast and well.

Catastrophe or Routine Service

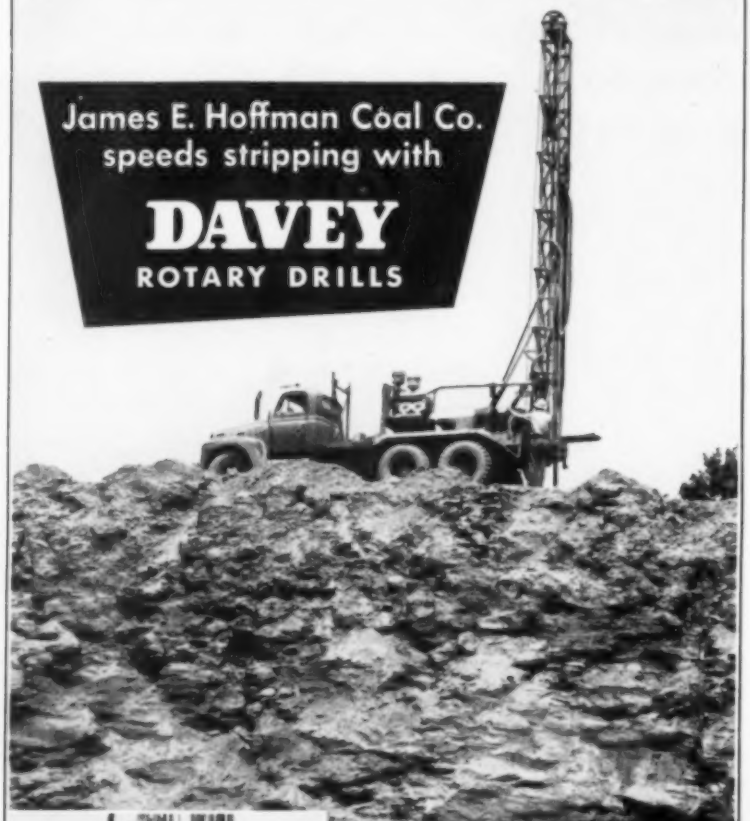
Whether it's complete catastrophe or a normal repair job, fast motor service can make a difference of thousands of dollars in lost production. As near as your phone is one of more than 100 Allis-Chalmers Certified Service Shops — ready to help save you production dollars.

These shops have manpower and equipment to perform repairs to Allis-Chalmers rigid standards. Their ability and integrity have been proven by years of service. They can do a good, fast job on any motor or generator, of any make. To locate the Shop in your area, call your nearby A-C district office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wis.

ALLIS-CHALMERS

A-5140

James E. Hoffman Coal Co.
speeds stripping with
DAVEY
ROTARY DRILLS



Like other leading mine operators, James E. Hoffman Coal Co., Karthaus, Pa., speeds drilling and cuts costs with Davey Rotary Drills.

Daveys are suitable for mounting on any make of truck . . . move fast between blast holes . . . are ideal for low cost core drilling . . . are easy to set in drilling position. Whether it's 60 ft. for overburden, as shown, or 2,000 ft. for oil, gas or water, your drilling can be done more economically—with less downtime —with Davey Rotary Drills. AA-1056

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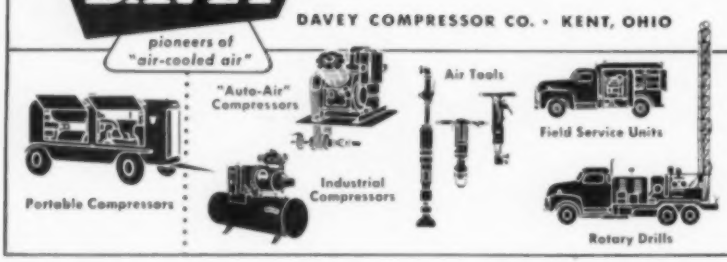


News Briefs *(Continued)*

substitution of natural gas would mean lower prices to consumers which would encourage new industry to come into the region. Opponents argued that economic hardship would result.

Pittsburgh Consolidation Coal Co. and Standard Oil Co. (Ohio) have formed the Mountaineer Carbon Co. to operate a carbon calcining plant at Cresap, W. Va. Present plans call for a 165,000 ton output annually of high grade calcined carbon for use as electro-carbon material in the aluminum, electro-metallurgical and chemical industries. Both companies will supply raw materials, Sohio shipping petroleum coke and Pitt Consol shipping coke. Operations are expected to begin in January, 1958. Pitt Consol's coke will be produced from the heaviest coal liquids to be formed in the recently announced $25 million coal processing plant being constructed in Cresap (**Coal Age**, Sept., 1956, p 122).

John C. Spigarelli, Lark, Utah, has been granted a patent and is preparing to manufacture a continuous miner he has named the "Spigmaster." The miner will run on tracks and will be powered

by a 200 hp motor. Four-foot turning wheels in front, into which high carbon steel bits are mounted, will dig coal, according to the inventor. Below the vertical wheels two horizontal wheels, also mounted with bits, will cut into the lower edge of a vein and, at the same time, load coal onto a conveyor belt. Two men will be able to operate the machine, according to Mr. Spigarelli, who says he plans to manufacture the miner in several sizes. His company, the Spigmaster Miner Corp., has commissioned the Wakefield Machine Works, North Salt Lake, to construct the first working model.

Edna Coal Co., Denver, Colo., has signed a $6 million contract with the Colorado-Ute Electric Assn., Nucla, Colo., to supply 1.4 million tons of coal a year to 1972. Colorado-Ute plans to construct a major power plant of undisclosed kilowatt capacity in the vicinity of Nucla. Edna will supply bituminous from new fields.

(Continued)

JIGGING stratifies materials according to specific gravity, separating solids in upward and downward pulsations of water. The heavier materials settle to the screen plate and are drawn off. The lighter materials overflow.

JIGGING is an almost universal separating process for materials ranging from the specific gravity of gold at 19 to coal at 1.3. Proportions of the high-gravity materials may vary from 90% to 10% or less.

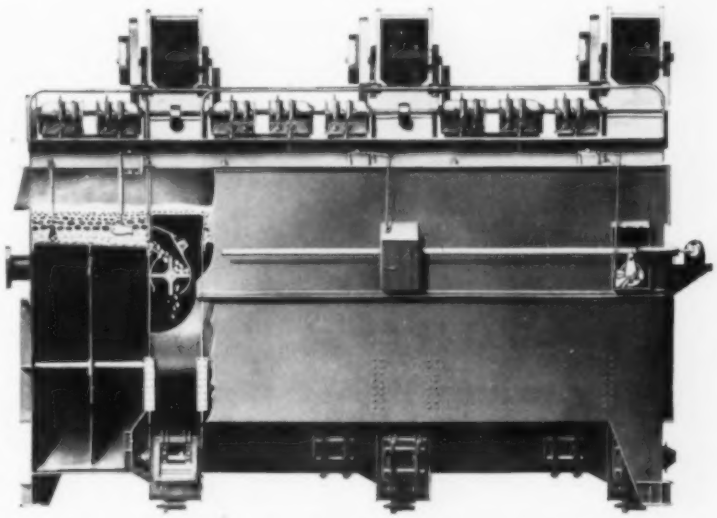
800 TONS PER HOUR...PER JIG!

Jeffrey coal-cleaning jigs have grown with the demand for higher tonnages and lower costs

Jeffrey jigs, in any size, provide a low-cost means of cleaning coal, separating fine and coarse sizes simultaneously. For years they've been handling some of the toughest separation jobs, recovering above 99.5% of the coal of a specified quality.

With a new principle of operating the Baum jig, Jeffrey has been meeting the constantly increasing demands for greater production by enlarging equipment.

If you have a coal cleaning problem, write to the Materials Preparation Division, The Jeffrey Manufacturing Company, Columbus 16, Ohio.



An 800-ton-per-hour Jeffrey jig stands 24 feet high and is 35 feet long.

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tops with the TOUGHEST critics!

Collyer twin parallel type G

Even among the toughest critics — the miners themselves — Collyer Type G Mining Cable consistently rates top preference for rugged, day-in-day-out duty. They like it for its high resiliency to sharp, crushing blows . . . its dense, tough neoprene sheath that guards conductors and ground wire against heat, moisture, oils, chemical, sunlight and flames . . . its full flexibility which permits constant reeling and re-reeling without undue wear. We guarantee you'll like it, too! Try it and see. Write for samples, prices and specifications *today*.

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News Briefs *(Continued)*

A Sweetwater, Wyo., coroner's jury suggested that Union Pacific Coal Co. institute a training program to familiarize new workers with controls of machinery used in the mines. The coroner's jury ruled the death of two miners an "unavoidable accident," but suggested negligence on the part of supervisory personnel for permitting an untrained man to tamper with machinery controls. The miners, Willie Lee Caddel, 21, of Rock Springs, and Ben Moser, 39, of Stansbury, were crushed to death by a runaway shuttle car they could not stop.

Reading Anthracite Co.'s Potts mine, Locustdale, Pa., is being reopened after a 2-yr shutdown by the Junedale Coal Co. Junedale has leased the mine and expects to employ 150 men.

The Federal Coal Mine Safety Board of Review finds that the Inland Steel Co. has taken steps to "restore a reasonable degree of protection from disaster" between a mine in which gas was found and other connected mines; therefore, confines the gassy classification to the single mine in which the gas was found. The case involved several mines connected by haulageways and entries. When gas was found in one mine, the Board said that the gassy classification would apply to all unless Inland Steel instituted protective measures.

George C. Trevorrow has been appointed safety director of the Bituminous Coal Operators Association, succeeding Marling J. Ankeny, who resigned to become director of the U. S. Bureau of Mines. Mr. Trevorrow, a graduate of Penn State University, was a coal-mining official in western Pennsylvania for a number of years. He was most recently associated with Paul Weir Co., Chicago, as a mine consultant in Turkey.

Peabody Coal Co., Chicago, purchased a large strip mine near Energy, Ill., September 1, from Morgan Mines, Inc., Indianapolis, Ind. The new property will be known as the Energy mine and includes over 2,000 acres of coal land. Otis English, formerly assistant superintendent at Peabody's Lynnville, Ind., operation, has been named superintendent at Energy.

The largest single overseas shipment of coal out of Hampton Roads was enroute to Italy September 18. The Italian vessel, Giovanni Agnelli, carried 17,239 net tons (2,240 lb per export ton) from Raleigh and Wyoming County, W. Va.,

(Continued)

Correction

The caption on p 65 of the August issue of *Coal Age*, under the perspective drawing of the Cali plant layout should read that reserves in the Cali-Timba area are estimated to be 415 million tons.

JOY Safety Circuit Centers (S.C.C. units) are the Mining Industry's most inexpensive insurance against the damages that electrical overloads, shorts and ground leaks inflict on men, machines and trailing cable. Supplied with one through four power feeder outlets, in a wide variety of A.C. or D.C. ratings to match both low and high vein mining requirements.

- **Available in "Dust-resistant" or "explosion-tested" housings**
- **Compact construction utilizes aluminum to reduce weight**
- **Power outlets individually protected by circuit breakers**
- **External arms reset breakers, turn current off and on**
- **Safety ground trip provides insulation failure protection**
- **ISC Circuit (*) permits approved cable sectionalization**

Note: Explosion-tested designs have been approved for use in gaseous atmosphere by the U. S. Bureau of Mines and they stay permissible in operation; i.e., no protective covers or fuses must be removed or replaced. Simple movement of outside breaker control handle restores protected power to machinery after fault has been corrected.
(*)*ISC Circuit is optional on all designs.*

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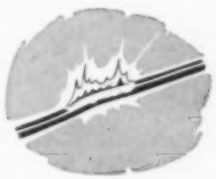
PROVIDE GROUND FAULT PROTECTION

Specially designed, foolproof core balance type ground protection available on all A.C. JOY S.C.C. units. Adjustable relay type available on D.C. units. Cuts power off lines when insulation failure permits dangerous flow of current to ground.



DECREASE FIRE HAZARDS

Circuit breakers cut current off feeder cable and machinery *in a split second* when dangerous shorts occur, preventing cable and machine insulation fires.

GUARD AGAINST EXPLOSIONS

JOY permissible style S.C.C. units (described at left) confine circuit breaking arc inside explosion-tested compartments. Available with intrinsically safe control (ISC) circuit that makes JOY connectors automatically drop load in opening process.

Consult a Joy Engineer

JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

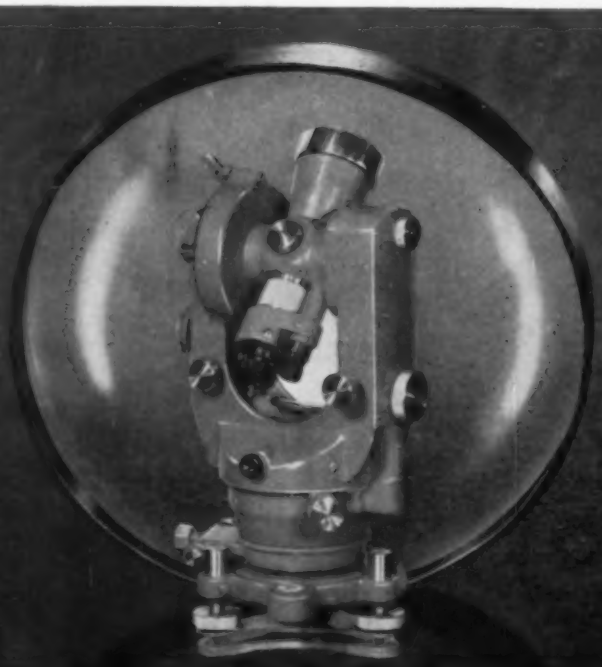
JOY MANUFACTURING COMPANY

General Offices: Oliver Building Pittsburgh 22, Penna.

In Canada: Joy Manufacturing Co., (Canada) Ltd., Galt, Ont.

W&D CL5630

WILD®
HEERBRUGG



WILD T-1 OPTICAL REPEATING TRANSIT

Here is unmatched speed, precision and convenience. Optically and mechanically, it is designed for fast set-up, error-free reading, maximum versatility, and for day or underground use under the most rugged conditions.

TWO MODELS AVAILABLE

New Model
Reading direct to 20 seconds, interpolation to 10 seconds.

Standard Model
Reading direct to 1 minute, estimation to 6 seconds.

Priced at $718 and $700 respectively, F.O.B. Port Washington, N. Y. Tripods extra.

WRITE FOR DETAILED INFORMATION . . . and use the Wild Heerbrugg advisory services without obligation.

WILD HEERBRUGG INSTRUMENTS, Inc.
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SALES • FULL FACTORY SERVICES

News Briefs *(Continued)*

mines of Eastern Gas & Fuel Associates. Castner, Curran & Bullitt, Inc., export subsidiary of EGFA, handled the shipment which represents 279 railroad carloads.

Association Activities

The Board of Directors of the National Coal Assn. at its meeting at White Sulphur Springs, W. Va., Sept. 12, transferred the market-promotion activities of the association to Bituminous Coal Institute, an NCA affiliate. The certificate of incorporation and bylaws of BCI are being amended to fit the needs of the planned market promotion program.

The following were elected to serve as members of the board of the new organization:

B. R. Gebhart, Freeman Coal Mining Corp.; Charles R. Griffith, Southern Coal and Coke Co.; R. L. Ireland, Pittsburgh Consolidation Coal Co.; Harry Junod, Pickands, Mather & Co.; T. L. Kelce, Peabody Coal Co.; John L. Kemmerer, Jr., Wise Coal & Coke Co.; Ralph H. Knode, General Coal Co.; George E. Owen, Imperial Coal Corp.; M. L. Patton, Truax-Traer Coal Co.; R. E. Salvati, Island Creek Coal Co.; W. S. Webster, Walter Bledsoe & Co.; Harold D. Wright, Republic Coal & Coke Co.

R. L. Ireland is president; Tom Pickett, executive vice president, NCA, was named a vice president.

Carroll F. Hardy and his staff will continue their present duties on an expanded basis under the framework of the new organization.

First meeting of the new board of BCI was held Sept. 26 in Washington.

The Wyoming Mining Assn. has announced the appointment of Russell W. Beamer as executive secretary. Mr. Beamer, before the appointment, had been associated with the Rochester & Pittsburgh Coal Co. for 12 yr. During that time he was a member of the Education Committee of the National Coal Assn. His Wyoming office will be in Riverton.

Obituaries

Floyd H. Hieatt, 52, supervisor of the Lillybrook Coal Co., Affinity, W. Va., died September 16 after a short illness.

Joe Falagrady, assistant mine foreman, Frederick mine, Colorado Fuel & Iron Corp., Valdez, Colo., was killed Sept. 5 in a rock fall. He was 63. Mr. Falagrady joined CF&I in 1907.

William Miller, 56, mine superintendent of the High Splint Coal Co., Harlan, Ky., died in Harlan Hospital Sept. 4 after a short illness.

6-Yd. Manitowoc Model 4500 dragline strips overburden 7 days a week for Jenkins Coal Company, Earlington, Ky.

Rugged Stripping Conditions?

On the Tough Jobs You'll Find Manitowoc!

When rough stripping conditions keep your balance sheet light on the profit side, look to the big capacity Manitowoc Model 4500 for economical coal stripping. For stripping operations that pay off you want a machine with a relatively low investment; that can be easily assembled and serviced by ordinary mechanics, far from metropolitan areas; and one that is mobile enough to move easily from one isolated job site to the next. With the Manitowoc Model 4500 you get all these advantages plus the big capacity production of a 5½-yd. shovel or 6-yd. dragline.

Ready For Rugged Conditions

Rolling, rocky terrain having steep grades and overburden of various depths is typical rugged stripping country. Here's where a Manitowoc 4500 really earns its salt! That's because a 4500 will handle unusually steep grades easy as a "cat" . . . and it has the long reach and steady stability to eliminate excessive rehandling of overburden.

Superior Features For The Tough Jobs

With the Manitowoc 4500 you get a big production unit having the speed and mobility of a small rig. Unmatched stability assures a long reach at full bucket capacities with less ground pressures. Elimination of several electric motors and miles of intricate wiring and connections affords more efficient utilization of power. No trailing cable to restrict mobility on the job — allows operations far from power source. Transport between jobs on railroad cars or highway trailers is simple and fast — days shorter than units of comparable capacity. Available as 6-yd. dragline and 5½-yd. shovel with standard or high-lift booms.

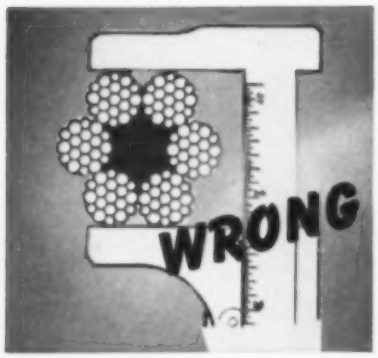
Your Manitowoc distributor has all the facts on the profit-making 4500 — see him now for the full story.

MANITOWOC ENGINEERING CORP.
MANITOWOC, WIS.

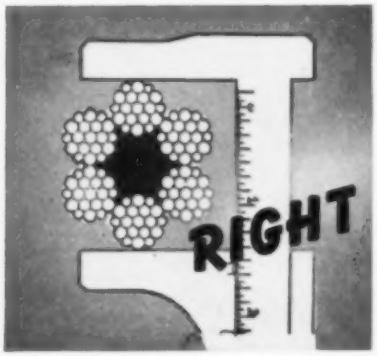
MANITOWOC
SHOVELS 1-5½ YD. Speedcrane CRANES 20-100 TON

Tuffy® Tips

If Present Rope Is Correct Size, Measure with a Caliper



Measuring the Wrong Diameter is a common mistake that some buyers make when they order replacement rope. When the rope arrives, it turns out to be too small—even though a machinist's caliper was used to assure accuracy. It's an easy mistake to make, but it's just as easy to remember the *right* way and be sure you get the right size rope. Otherwise both the safety factor and service life of the rope will be reduced.

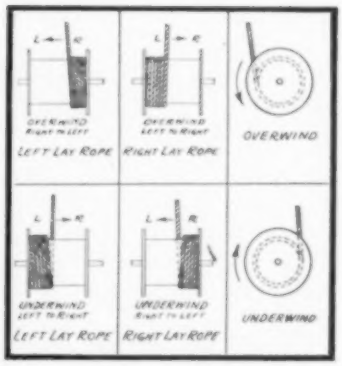


Measuring the Right Diameter is the simple step shown above. Measure so that a single strand is on each of the adjustable edges of the caliper—*not* two strands that measure as a flat side. The actual diameter of a wire rope is the same as that of the circle required to circumscribe it. The diameter of a wire rope is an important factor in determining the safe working load to be handled by your equipment.

How To Measure Groove Diameter

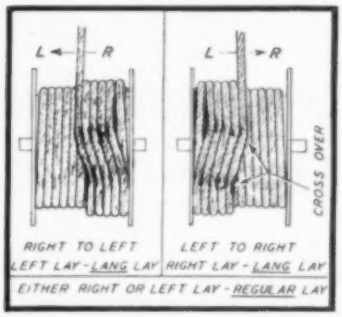
Shown above is the WRONG way to measure the groove diameter. The result—shorter life of the wire rope you buy. Note that only the sides of the rope will bear on the sheave. In a relatively short time this will squeeze the rope out of round and set up destructive friction and stresses on the rope strands and wires. New rope is oversize and diameter of grooves on sheaves and drums should be slightly larger.

Shown above is the *CORRECT* way to measure the groove diameter. It is a simple thing to do and will give the rope you buy a chance to deliver all the service it possibly can. Remember a wire rope is composed of many closely correlated working parts and sheave grooves which are too large or too small throw them out of alignment. Just like any other working part on a machine, wire rope cannot do its best if it is misfitted.



Rope Lay for One Layer Winding

These diagrams show when it is best to use right lay or left lay rope on one-layer winding. The direction of winding is determined by standing behind the drum, looking toward the direction of the rope travel.



Rope for Two Or More Layer Winding

When a rope winds on the first layer across the face of a drum, it usually travels in a uniform pattern. But when it reaches the flange of the drum, the rope rides on the last strand of the first layer for one turn. Then, it slips into the grooves between each course of rope on the first layer. To move across the drum in this manner, the rope actually winds *back* a turn in each revolution. Then it must jump across *two* grooves in the first layer. This always occurs on the even-numbered layers, and often causes crushing. This abuse is minimized by use of properly designed grooves, spacers and lifters.

In Shoes Or In WIRE ROPE Misfitting Is Hard On The Pocketbook

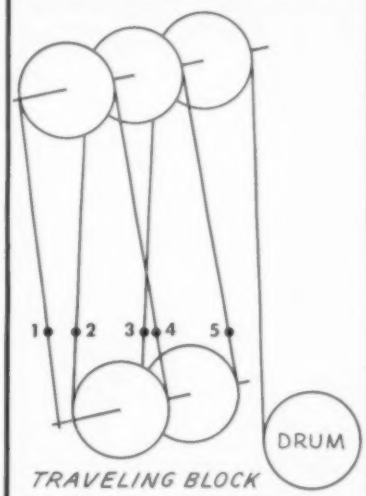
Replace Worn Sheaves

Check for sheaves that have been badly worn. Sheaves that have grooves corrugated by the rope lay impression should be replaced immediately before installing new rope. Since rope creeps to a certain extent on sheaves these grooves can actually cut the strands as the rope runs over. This will greatly reduce service life of *any* wire rope.

Breaking In New Rope

After a wire rope is installed, it is advisable always to run the new wire rope with a light load or with no load for a short period of time. This "breaking in" process gives the component parts of the rope an opportunity to adjust themselves to the conditions under which the rope is to operate. The time spent "breaking in" a wire rope will pay dividends in extra useful rope life.

How To Count The Number of Parts Supporting the Load



Draw an imaginary line across the parts of the rope supporting the load.

The wire rope on many machines is not used in a single or direct pull. It is often reeved through sheaves, which gives a mechanical power advantage.

Send For Free Chart Which Allows Easy Figuring of Actual Stress On Rope For Any Given Piece of Machinery Reeving From One to Eight Parts.

Don't Say "Wire Rope"—say Tuffy

Tuffy Dozer Rope

Mount a 150' reel of 1/2" or 9/16" on your dozer, cut off only worn sections, save good rope otherwise wasted.

Tuffy Draglines

Extra toughness for prolonged service. Flexible enough to hug the drum when casting. Extra resistance to abrasion. Cuts replacement costs.

Tuffy Slings

Proof tested for strength. Easy to hitch on and off. Kinking will not materially damage the 9-part, machine braided construction. Team up with Tuffy Hoist Line.

Tuffy Slusher Rope

Maximum rigidity to fight off drum crushing, yet flexible on small tail sheaves. A unique, high strength 3-strand construction with high abrasion resistance.

Tuffy Scraper Rope

A special rope construction balanced to meet the tough, complex stresses which scraper service deals out.

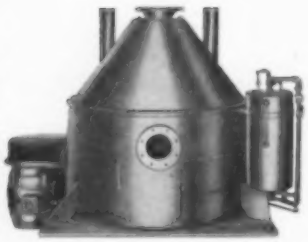
Your Tuffy Distributor Works to Learn Your Business

When new equipment comes out, he has already checked into it . . . finding out why it does the job better, how it works. Why? Because he's interested in earning your continued patronage. And part of that service is helping you out with fast answers *when* you need them—especially right answers to your wire rope problems. Give him a call.

union Wire Rope corp.

4 2130 Manchester Avenue Kansas City 26, Missouri

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand



FOR DRYING COAL THE ECONOMICAL WAY

. . . your best buy is C·M·I. Through 40 years of experience, C·M·I has developed a dryer that provides an actual saving of 24% in horsepower over other comparable units. This new, improved centrifugal dryer offers you smoother, more dependable performance in addition to drastically reduced operating and maintenance costs.

If you are searching for an economical answer to that expensive heat-drying problem, write C·M·I for particulars.

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CONTINUOUS CENTRIFUGALS

Reap additional profits with efficient slurry recovery.

C·M·I Centrifugal DRYERS

CENTRIFUGAL & MECHANICAL INDUSTRIES, INC.
146 PRESIDENT ST.
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Foreign News

Great Britain

The allocation of British coal to the European Coal and Steel Pool countries during the fourth quarter of 1956 is to be increased by 100,000 tons to 600,000 tons. The British allocation compares with 512,000 tons in the third quarter. The increase will have only a slight effect on the prospective coal deficit of the Pool countries during the fourth quarter. Despite an increase of 1.1 million tons in production to 62.7 million tons and the raising of imports to 10 million tons (of which the U. S. will contribute 8.3 million tons), estimates show that there will still be a deficit of 2.8 million tons. Since pithead stocks of salable coal remain low, the deficit will probably have to be made up by further imports.

As a means of increasing its efficineyc, a plan for the partial nationalization of the coal distribution industry in Britain is contained in a Fabian research pamphlet issued in September. The pamphlet points out that there has been little change in railway depot operations for the last 50 yr and suggests that remedies for inefficiency include:

1. Break-up of the existing pattern of merchants' rights and interests at the depots.
2. Concentration of depot operations to admit full use of mechanical appliances for discharging wagons, filling and weighing sacks and stacking coal on the ground.
3. Availability of sufficient capital.
4. Creation of an adequately-financed organization to install and operate the mechanical appliances as a common carrier service for users.

Regarding actual delivery, objectives listed include concentration of the area within which truck loads are delivered, bonus schemes for carrying off more than a certain minimum daily tonnage, experimentation with discounts for local deliveries, and maximum incentives to buy summer coal.

The appointment of one national and several regional coal distribution councils by the Minister of Fuel and Power were recommended. These will consist of representatives of the National Coal Board, the Gas Council, the Transport Commission, consumers, trade unions and cooperative societies. It was also recommended that publicly-owned companies be formed by regional amalgamations of large merchants.

Important developments with fluidized bed carburization and oxidation techniques using powdered coal are making way for a large expansion of smokeless fuel briquetting in Britain. This was revealed during an international conference on chemical engineering in the coal industry held this summer by the National Coal Board at its Cheltenham, England, research establishment. So far highly volatile non-coking coals have proved

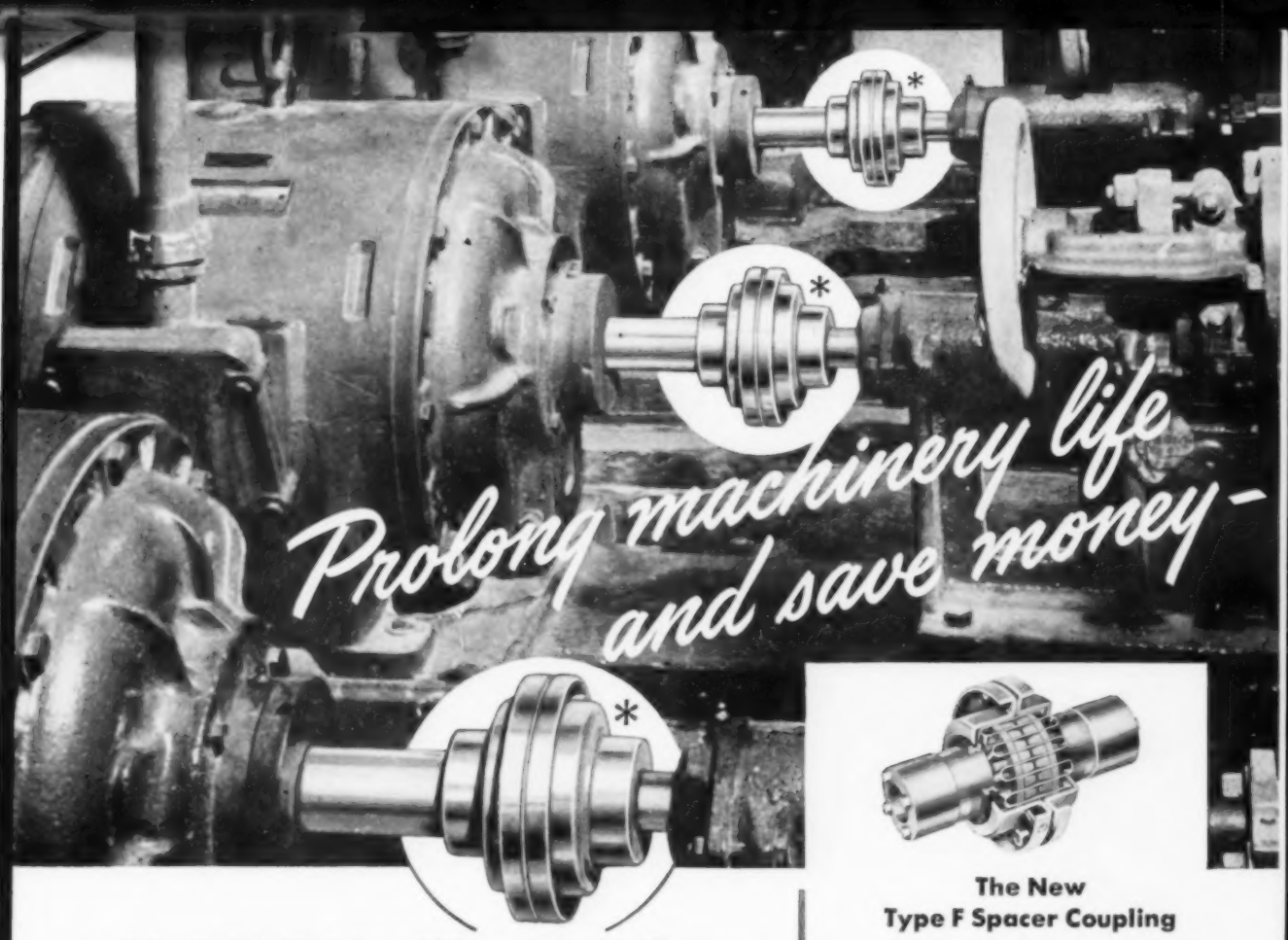
unsuitable for coke or smokeless fuel production by established processes, and these coals form the major part of British deposits.

The NCB showed conference delegates these pilot plants incorporating new processes:

1. A simple and completely automated 1 tph oxidation plant using fluidized beds, the process proving exothermic and self sustaining.
2. A chemical treatment plant for higher volatile coals which do not respond to oxidation.
3. A fluidized carburization plant with throughput of 100 lb per hour (a very promising operation with a 1 tph plant is also reported from France).
4. A hot briquetting plant utilizing plastic properties of hot powder under pressure. This process eliminates briquette cooling and heating cycle and the need for most of the binder normally required.
5. A plant for carburizing binder in briquettes which uses continuously cycled sand as a heat transfer agent and greatly reduces residence time associated with conventional external heating.
6. An improved froth flotation plant to reduce the ash content of briquettes. Agitation is completely pneumatic.

BELGIUM

Freight ships, as well as tankers, may have to be tawen out of mothballs because of developments in the European coal crisis. The six Schuman plan nations have been growing more and more dependent on outside sources, especially the United States, under the influence of a steel boom. Together, the six nations produce about 250 million tons of coal yearly. Despite this net imports are increasing. Last year net imports jumped to almost 13 million tons from 6 million metric tons in 1954. The latter figure meant bringing in 23 million tons, of which almost 16 million came from the United States. This year supplies are tighter. Quarter by quarter the shortage has grown worse. In October-December,



with FALK Steelflex Couplings

Ever since the first Falk Steelflex Coupling was designed and built, we have firmly held to these beliefs:

1. A coupling, to give fullest value, must do more than merely *connect* driving and driven machinery—it must *protect* the machinery and prolong its life.

2. A coupling, to be truly flexible, must overcome the effects of shock and vibration, as well as shaft misalignment.

Proof of the soundness of those beliefs is furnished by the record. More than one million Falk Steelflex Couplings have been used on every conceivable type of industrial application . . . giving trouble-free service, providing maximum protection to connected machinery.

* A single basic type—the famous Type F—fills 90% of all industrial application needs. It is versatile, efficient and economical. And—it is always available from factory, field or distributor stocks, in a wide range of sizes.

Write to Department 247 for engineering bulletin, including selection and dimension tables.

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

MANUFACTURERS OF:

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

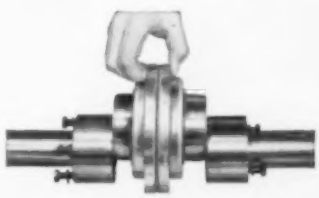
...a good name in industry

The New Type F Spacer Coupling

Here is a Steelflex coupling specially designed to permit fast, easy installation and removal in horizontal and vertical applications where it is impracticable to move the connected units—or where a space-gap (up to 12 in.) is necessary.

Like all Steelflex couplings, the Type F Spacer gives long, trouble-free service and maximum 3-way protection for connected machinery: it provides torsional resilience to reduce shock and vibration; it accommodates parallel or angular shaft misalignment; it allows free (or limited) end float.

An outstanding feature of the Steelflex Spacer is that it can be installed or removed in one piece (see photo below); no dismantling or servicing of the coupling is required. Pump assemblies can be disconnected and removed without disassembling the coupling, without exposing working parts.



The Steelflex Spacer coupling is prelubricated at the Factory and can be installed, or removed and reinstalled, without disturbing the lubricant—a highly desirable feature.

REG. U.S. PAT. OFF.
Kleenslot

This Screen Guard can be used in any mining and industrial field and is particularly adaptable for use in flumes. Only the finer particles pass over the screen.

mining

foods

WEDGE WIRE PREPARATION SCREENS AND SCREEN GUARDS PERFORM WITH

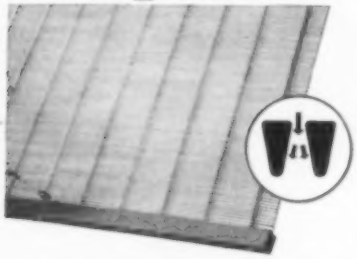
top efficiency

chemicals

abrasives

oil

The trade name KLEENSLOT stands for high quality precision made screens, giving top performance and efficiency in screening, dewatering, washing, extracting, filtering, or sizing applications. They are made of specially formed wedge shaped wire to afford clear rapid passage of materials and to eliminate blinding. Highest production is the greatest feature of WEDGE WIRE products. Write for literature!



WEDGE WIRE Vibrator Screens can be designed to fit any make of vibrator.

Wedge-Wire CORPORATION
Gas Street at Nickle Plate R. R.
Wellington, Ohio

Foreign News *(Continued)*

there will be a shortage (after estimated imports) of 11½ million tons—ahlf as much as in the whole of 1955. Somewhere between nine and ten million tons will be bid for in the United States. The fourth-quarter estimates were struck before any account had been taken of the accelerated deterioration of Belgian mining. Belgium contributed nearly 30 million tons of the 246.4 million tons turned out by the six nations last year. But, she manages to produce only by importing underground workers from other countries, mainly Italy.

Thus, Belgium makes special efforts to recruit labor. In February, 1956 Belgium's underground force was 115,700. But, Italy, dissatisfied with safety conditions stopped Belgian recruiting. By July Belgium's underground labor force had fallen to 109,000.

Then, on August 8, came the Marcinelle mine explosion in which 262 miners died. (*Coal Age*, September, 1956, p 142.) The results have been more and more Italians are leaving and Belgium's miners have dwindled to 105,000.

Apart from the effect in Belgium itself, the shortage will necessarily spread through the whole comomn market of the six nations—and the only source for the emergency supplies required is the U. S. The great fear is not the question of supplies. The High Authority's vice president, Franz Etzel, has already told the six nations that the United States must be regarded as Europe's natural source of coal. The problem is price. The great rise in shipments cannot fail to have an effect on freights which are the key factor. If the tonnage shipped is to rise from last year's average of 4 million tons a quarter to over the 10 million estimated for the fourth quarter of 1956, United States coal will become very expensive indeed—even in a market where the domestic consumer pays, as they do in Belgium(over $40 per ton. It might even happen that the demand will rise as far as 15 million tons a quarter.

Meantime, what everybody is waiting for is a hint about what will happen to freight rates as shipments from the United States increase. Only mothball tonnage it seems, can really solve the problem.

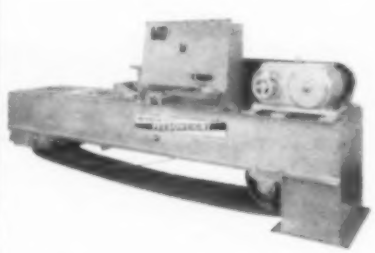
Responding to the pressure of public opinion after the August mine disaster at Marcinelle (*Coal Age*, Sept., 1956, p 142), the government has begun considering a plan for the "semi-nationalization" of the coal mining industry. Under the plan the industry would be directed by a "round table" administration composed of employer and union representatives. The government also would be represented. The "round table" would leave actual colliery management to a management board, but would act under the government's direction on safety.

RUSSIA

Russian mines have failed to meet the demands of Russian industry under the latest 5-yr plan and strenuous efforts are being made to avoid a critical shortage. The minister of the coal industry, Mr. Zademidko, has warned miners of a looming crisis, pointing out that some pits have fallen below last year's output. The minister says that Russia produced 391 million tons last year. The present five-year plan calls for an annual output of 593 million tons by 1960. Observers believe that the main causes for Russian anxiety are an absence of elementary discipline in production and technology. Meanwhile, Russia is pressuring Poland to increase its coal exports to the U. S. S. R., to take up the slack in Russian production. Poland has responded by opening a new field in eastern Poland.

Eager to make an all-out bid to enter into India's industrial developments projects, Russia sent out another team of experts to that country in September. This time Russian experts will plan a plant to manufacture coal mining machinery, most of which is now imported. For this project, New Delhi has earmarked $56 million.

The overall Second Five Year Plan investment allotment for mining machinery is $85 million. High investment priority is given to coal mining machinery because New Delhi considers it urgent to



Yes-feed by weight

with the MERRICK FEEDOWEIGHT, a self-contained automatic conveyor scale, with automatic gate for feed rate control. Powered feed regulator operates gate, without restraint on scale beam. Uniformly feeds bulk material BY WEIGHT; automatically totalizes weight of materials fed. Simple to operate. Slow moving parts mean long life. Easy to install, maintain.

Manufacturers of

The Merrick WEIGHTOMETER, which weighs any material carried on a belt conveyor without interrupting conveyor operation. Complete descriptive matter on request.

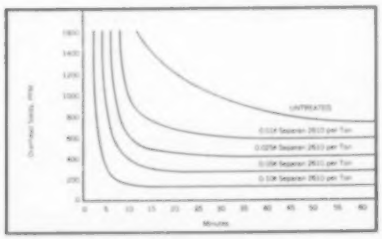
MERRICK SCALE MFG. CO.
Engineers and Mfrs. of Automatic Weighing Equipment
PASSAIC, N. J.

COAL FINES SETTLE 17 TIMES FASTER WITH ADDITION OF SEPARAN 2610

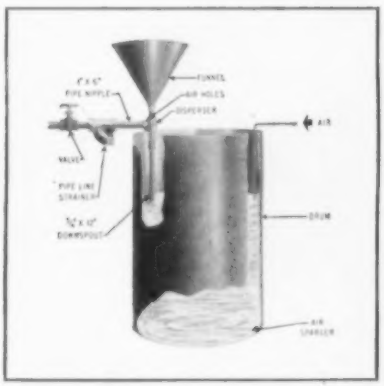
New flocculating agent breaking bottlenecks in nearly every use

A coal thickener in a West Virginia plant was overloaded. It took over 2 hours to clear to the desired 300 ppm overhead solids. Separan* 2610 was added at the rate of 0.05 lb. per ton of fines. Clarification time was cut from 2 *hours* to 7 *minutes*! 17 times faster! Besides cleaning up overheads and avoiding stream pollution, you can employ closed circuits and conserve water with this new flocculating agent. You can cut down recycle solids and reduce maintenance. You can recover more fines by improving filter rate. And, very important, you can increase plant capacity by getting more throughput on present equipment.

COAL FINES—SETTLING RATE



Separan 2610 is different. It's a synthetic, organic polymer that is effective in both acid and alkaline media. It's highly economical. It requires no preservative. But that's not all! It's noncorrosive and presents no health hazard in normal handling and use. And it's easy to prepare and apply. Interest aroused? Write for particulars and a sample to THE DOW CHEMICAL COMPANY, Dept. TS930E-2, Midland, Michigan.



New disperser has been developed by Dow to permit dissolving of large amounts of Separan 2610 without use of a mechanical mixer. This solution needs no preservative in normal storage or use. **Trademark*

you can depend on DOW CHEMICALS

DOW

Power shovel of Hanna Coal Company, Division of Pittsburgh Consolidation Coal Company, at work in its Georgetown No. 12 open-cut mine.

On the Mighty Mountaineer...

HUNDREDS OF FEET OF AEROQUIP HOSE LINES USED FOR AUTOMATIC LUBRICATION OF CRAWLERS

Wayne Fuhr, chief lubrication engineer, checks Aeroquip Hose Lines on the automatic crawler lubrication system of the world's largest mobile unit.

To provide lubrication of the eight giant crawlers on which the Mountaineer moves, Hanna engineers designed an automatic system using dependable Aeroquip Hose Lines. In addition to giving long service, Aeroquip can be replaced quickly, when necessary, right in the field. Call your Aeroquip Distributor listed in the Yellow Page Phone Book or write us for full information on this quick replacement idea.

Aeroquip

REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

IN CANADA: AEROQUIP (CANADA) LTD., TORONTO 15, ONTARIO
LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U. S. A. AND ABROAD
AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U. S. A. AND ABROAD

Foreign News *(Continued)*

speed up India's coal production as quickly and as economically as possible because of the fuel's basic importance.

India's coal output has risen from its 1950 total of 32.3 million tons to 38 million tons in 1955. State-owned collieries have produced to date only 4.5 million tons, while private enterprise produced the remaining 33.5 million tons. In a realistic mood, therefore, New Delhi has assured the existing private colliery operators that they do not intend to nationalize existing units, provided they achieve the increased production target of 10 million tons allotted to them. Despite governmental assurance, however, private enterprise operators are unhappy. Labor costs, they say, are high. And price adjustments to make up increased labor costs are dictated by New Delhi.

WEST GERMANY

Bonn has completed negotiations with the Soviet zone of Germany to buy 4.2 million tons of brown coal in 1957. The agreement was reached within the rules of the Interzonal Trade Agreement. East and West have left the door open for even larger tonnages.

FRANCE

Coal-short France has announced the discovery of a new deposit estimated at 200- to 215-million metric tons. Charbonnages de France, the coal authority that controls the state-owned mines, says the deposit is situated near Lons-le-Saunier in the Jura Mountains near the Swiss border at a depth between 1,640 and 3,280 ft. Reportedly, the coal contains 30% volatile matter, and has a low ash content. France plans to spend $57 million developing the deposit and expects to start production in five years. Five thousand miners will be needed.

French collieries have experienced a sharp expansion in demand for coal since the middle of last year, according to a statement of the French Coal Board (Charbonnages de France) on results and prospects of the French coal industry. The statement accompanied the management report for 1955 dealing with the financial, commercial and social activity of Charbonnages de France.

French demand grew rapidly at the end of 1955 and still more this year, the report noted. "Stocks which earlier had reached a disconcerting level have melted like butter," it said. They fell from 3,400,000 tons at the end of 1954 to 1,300,000 tons in December, 1955, and to only 500,000 tons at the end of June 1956. Despite the efforts of French collieries a coal shortage is appearing, the report added.

This tight supply situation was evident despite the stepping up of imports and the cut in exports. Imports (not including deliveries from the Saar) rose from 12,-

(Continued p. 172)

"CINCINNATI MINE" IS WORLD FAMOUS

THE WORLD'S FINEST COAL CUTTING EQUIPMENT

In thousands of mines all over the World, Cincinnati Chains, Bits and Bars are helping Mine Operators reduce coal cutting costs. The wide acceptance of Cincinnati Coal Cutting Equipment over a period of years is proof of its top performance and dependability . . . proof of the soundness of the engineering and design built into Cincinnati Coal Cutting Equipment. If you have a particular cutting problem, let us hear from you. The chances are we can help you as we have helped hundreds of the world's largest producers. Feel free to call on us or any one of our representatives at any time.

CINCINNATI STANDARD CHAIN

Similar in design to the DUPLEX . . . accomodates either standard mine sharpened bits or the popular Stanex Holder and Bit.

STANEX MOUNTING

Combination of strong durable holder and Stanex reversible Double Ended Bit to fit Cincinnati Standard Chain or other standard chains.

CINCINNATI DUPLEX CHAIN

The Cincinnati Duplex Chain with the Duplex Bit is recommended for maximum cutting efficiency. The block and connector are drop forged of high grade alloy steel, carefully heat treated and scientifically engineered to withstand hard usage.

DUPLEX C-11

For all-purpose cutting, this bit offers the best obtainable value in cutterchain bits. Available in various grades . . . is reversible and double-ended . . . has sharp points . . . keen cutting edges . . . long life . . . locks securely . . . easily removed.

DUPLEX F TYPE—PLAIN

This bit gives you dependable service under the toughest cutting conditions (where other bits have failed) due to its specially reinforced tip which provides a stronger cutting point.

DUPLEX F TYPE TIPPED BIT

Where cutting conditions are favorable to tipped bits . . . Cincinnati's exclusive tipping process makes this the lowest cost throw-away type carbide tipped bit available.

THE CINCINNATI MINE MACHINERY CO

2983 SPRING GROVE AVENUE • CINCINNATI, OHIO

Alabama By-Products Corporation Installs *Continental* Belt Conveyors at Its Large, Modern MAXINE MINE

Underground belt conveyor, as seen from slope bottom, carries coal to surface cleaning plant.

Overland belt conveyor transports coal from cleaning plant to dock loading stations.

The new Maxine plant of the Alabama By-Products Corporation, located about 30 miles west of Birmingham on a fork of the Warrior River, was designed to process American seam coal mined underground into a product specifically suited for utilization in electric utility steam plants.

Maxine mine is Alabama's newest and one of the South's largest. It is also one of the nation's most fully mechanized mines, employing the latest type of continuous mining equipment.

Coal is fed by a 42" CONTINENTAL slope-belt conveyor to the modern plant on the surface. Part of the output is then transported overland 2500 feet on 30" CONTINENTAL belt conveyors to a dock loading station, thence down to the river barges. The remainder is loaded into railroad cars.

Maxine is one of the many large modern, mechanized mines where Continental Belt Conveyors are doing an outstanding job. For complete information on this equipment, write for Bulletin ID-481A.

CG-5603

Continental Idlers—A Few of Many Types

Standard Duty Idler

Rubber Disc Impact Idler

Rubber Tired Impact Idler

Self-Aligning Troughing Idler

Self-Aligning Flat Belt Idler

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • CLEVELAND • DALLAS • KNOXVILLE CGC MANUFACTURERS
MEMPHIS • NEW YORK 17, NEW YORK

Wire Rope at Work—This monster, which looks like a cross between a battleship and a dragon, can scoop up 22 yd of earth at a single pull of the bucket. Its insatiable appetite for rock and dirt is its greatest asset, especially in stripping large areas where the overburden is thick.

The huge excavator would get nowhere, of course, without the wire ropes that drag and hoist the bucket. On this job, Bethlehem Purple Strand was used for both applications—2¼-in. 6x25 for the draglines, 1¾-in. 6x41 for the hoist lines. Whopping big cables, particularly the drag ropes; even in the roughest kind of going, they put "hustle" in the job. Ropes like these can move that bucket all day long and still be ready for more.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

MINING • QUARRYING • CONSTRUCTION • EXCAVATING • PETROLEUM • LOGGING • MANUFACTURING

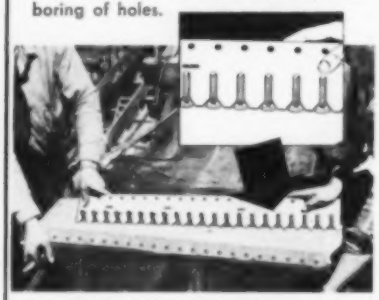
NEW

FLEXCO POWER TOOLS

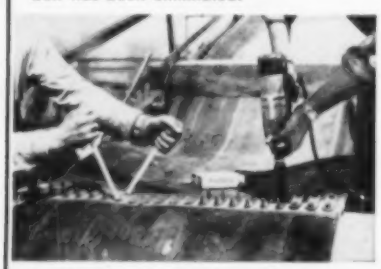
CUT APPLICATION TIME IN HALF

Your two man belt team can now join a belt 30" wide in 15 to 20 minutes . . . using the new FLEXCO Power Tools.

The FLEXCO Power Tool Boring Bit used with electric or air impact tool speeds boring of holes.



New FLEXCO Templet positions bolts for quick joining of belts. Reaching under belt has been eliminated.



Running down nuts is fast with the new FLEXCO Power Wrench used with electric or air impact tool. Two Bolt Breakers are used together to complete the joint.

If you are interested in speeding up fastener application, order the new Power Tools from your local FLEXCO Distributor. Write for Bulletin F-112-A.

FLEXIBLE STEEL LACING CO.

4638 Lexington Street • Chicago 44, Illinois

Personal Notes

Raymond M. Davis, president of the Davis-Wilson Coal Co., Morgantown, W. Va., retired last month after 41 yr in the coal industry. Davis-Wilson is the sales company for Trotter Coal Co., Morgantown. Besides gaining a degree of fame within the industry Mr. Davis achieved a reputation for his interest in

Mr. Davis

national, state and local affairs. At one time, years before the construction of modern through-ways, he proposed construction of a 16-lane superhighway from coast to coast. In 1940 reports filtering out of West Virginia demonstrated that backers were seeking the vice presidential nomination for him on the Republican ticket. Mr. Davis, at that time, said he would file for the presidential nomination and then, after the 1940 primary in November, "request my delegates to withdraw for me as president and support me for vice-president." Last year Mr. Davis was awarded an honorary degree of Doctor of Laws by West Virginia University in recognition of his interest in the welfare of the youth of West Virginia.

A round of promotions last month followed the retirement of **Lester Diehl,** Glen Alden Corp. purchasing agent. **Fred L. Klipple,** general superintendent, moved into the purchasing agent post vacated by Mr. Diehl; **Ivor Williams,** Audenreid Colliery superintendent, was advanced to general superintendent, succeeding Mr. Klipple, and **Thomas Davis** was made superintendent of Audenreid, succeeding Mr. Williams.

Mr. Diehl joined Glen Alden before World War I. His retirement terminates a 40-yr career with the company. Mr. Klipple, onetime mining engineer for the Lehigh & Wilkes-Barre Coal Co., has worked as section foreman, mine foreman and superintendent. He was promoted to general superintendent six yr ago. Mr. Williams joined Glen Alden as a mine foreman, became superintendent of Audenreid three yr ago. Mr. Davis, a Glen Alden employee for a number of years, is an experienced construction and maintenance man.

John E. Ellis has been appointed superintendent of maintenance at Crucible Steel Co.'s Crucible, Pa., mine. The post is a newly-created one and involves supervision of electrical and mechanical repair, in addition to maintenance of the Crucible mine operations. Before his appointment, Mr. Ellis served as chief electrical engineer at the Crucible mine. He joined the company in 1955 after leaving a job at the mines of Allied Chemical & Dye Corp., Semet Solvay Div., Mullens and Harewood, W. Va.

Emmet T. Lang, former industrial engineer for the North American Coal Corp., has been appointed general manager of the company's Conemaugh mine and related operations. **Dr. Robert L. Savage,** professor of chemical engineering at Case Institute of Technology, has been elected North American's vice president in charge of research. Dr. Savage will head a long range research program for North American from an office in Cleveland.

Guy Browning, an engineer with 20 yr of experience in West Virginia and Kentucky coal mining, has been appointed general superintendent of the Lorado Coal Mining Co.'s operations in Lorado, Logan County, W. Va. Before the appointment Mr. Browning had been associated with Robinson & Robinson, mining engineers, Charleston, W. Va. His mining experience includes posts as section foreman, engineer, mine superintendent and underground superintendent for United States Steel Corp., Gary, W. Va.; Island Creek Coal Co., Holden, W. Va.; Central Coal Co., New Haven, W. Va.; and Kentland-Elkhorn Coal Co., Dunlap, Ky.

Mr. Browning

A. E. Spotti, superintendent of Pursglove No. 15 mine, Christopher Coal Co.,

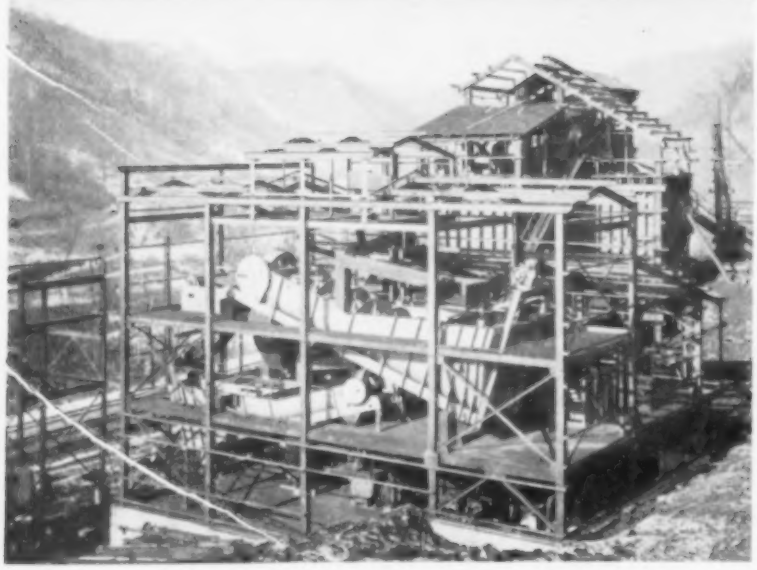
TYPE 7400 IN PENNSYLVANIA

This walking dragline sets the pace at a western Pennsylvania coal mine. Its 13 yard bucket on a 185-foot boom makes 65 to 80 foot cuts. In this photo, the MARION 7400 Walker towers over a 3-yard Marion loading shovel.

MARION POWER SHOVEL CO., MARION, OHIO

AKINS SEPARATOR

makes 3-product separation in coal cleaning plant



This coal cleaning plant, as all prefabricated Sweco Heavy Media plants, is designed by the Southwestern Engineering Co. for the use of an Akins Heavy Media Separator, which is successfully making a 3-product separation with only one media cleaning circuit, using an Akins Heavy Media Densifier.

PRODUCES 2 GRADES OF COAL

This Akins Separator is making a 3-product separation, requiring only one media circuit. The Akins Separator, permitting extraction and blending of middlings with either float or sink, makes it possible to improve both grade and recovery and produce two types of coal from the same seam . . . one a high grade for domestic and industrial uses and one a high-ash product for large steam plants.

PROVED ADVANTAGES OF AKINS SEPARATORS

• 3-product separation in one machine, requiring only one media circuit • Start-up under full load • Entire vessel is visible and accessible • Variation in rate or grade of feed is not detrimental • Large pool area and volume minimize tramp refuse in the product and facilitate better recovery of values from fine sizes • Gradation of gravity and viscosity from feed entry point to sink removal point provides natural cleaning of sink, and allows circulation of media at lower gravity and viscosity.

WRITE FOR NEW AKINS SEPARATOR MANUAL 56

Akins—the ORIGINAL spiral type classifier.

COLORADO IRON WORKS CO.

1624 17th Street • Denver 2, Colorado

AKINS CLASSIFIERS • SKINNER ROASTERS • LOWDEN DRYERS

Sales Agents and Licensed Manufacturers in Foreign Countries

A SUBSIDIARY OF THE MINE & SMELTER SUPPLY CO.

Personal Notes *(Continued)*

has resigned to accept the post of general manager of the West Virginia Div. of the Powellton Coal Co., Mann, W. Va. **Cleon Fowler,** superintendent of Christopher's Osage No. 3 mine, succeeds Mr. Spotti in the Pursglove job. **Warren Sharpenburg** has been appointed acting superintendent of Osage No. 3.

Kenneth K. Kincel, superintendent of No. 93 mine, Consolidated Coal Co., W. Va., has been appointed superintendent of New Loveridge mine. **H. S. Turner,** a mine foreman from Consolidation's No. 2 mine, succeeds Mr. Kincel at No. 93.

C. H. Sawyer, consulting engineer for the Coal Div., Eastern Gas & Fuel Associates, Pittsburgh, has been appointed assistant sales manager.. Mr. Sawyer will

Mr. Sawyer

be sales representative to coke plant customers, particularly the western plants formerly handled by **A. E. Robertson,** who is retiring. Mr. Sawyer will continue his technical service to coke plant customers and maintain contact with the research activities of the coal carbonization industry. He was appointed consulting engineer in 1950.

John Frassinelli has resigned as senior industrial engineer of U. S. Steel's mines in Gary, W. Va. to join the consulting engineering firm of Robinson & Robinson, Charleston, W. Va. Before taking a job with U. S. Steel, Mr. Frassinelli had been employed by the Pennsylvania Coal & Coke Corp., and Lehigh Coal & Navigation Co.

J. C. Kirby has been appointed superintendent of Stotesbury No. 11 mine, Eastern Gas & Fuel Associates, Helen, W. Va., succeeding **J. H. Benedict.**

Joseph Comuzie, Decota, W. Va., has been appointed general mine foreman of No. 9-X mine, Carbon Fuel Co., Carbon, W. Va.

At these TOUGH WEAR points, specify

"THE TOUGHEST STEEL KNOWN"*

Sprockets
Amsco® Manganese Steel sprockets and replaceable rims, hardfaced with Amsco "Economy Hardface C", give 3 to 4 times the life of ordinary sprockets.

Rollers, Idlers
Automatic build-up, then hardfacing with Amsco AW-79 Rod, gives twice the wear of original parts, saves 50% on replacement.

Track Shoes
Manganese Steel construction, with grouser bar integrally cast, and holes counter-sunk so bolts can be re-used. For temporary repair, grouser bar is torch cut and welded to shoe.

End Bits
Corner inserts of Amsco Manganese Steel add extra service life to blade. Amsco HF-40 hardfacing further increases wear resistance.

Scraper Blades
Amsco Manganese Steel gives longer lasting "bite". Amsco HF-40 is ideal for hardfacing.

*AMSCO MANGANESE STEEL . . . plus AMSCO HARDFACING

Shown above are just a few of the "tough wear" points where Amsco products can save you money. Whether for original parts, or for build-up and hardfacing, specify Amsco Manganese Steel and Amsco Hardfacing for maximum operating economy.

We'll be glad to give you full information on Amsco Tractor Parts, Hardfacing Materials or Automatic Welding Machines. Just call your nearby Amsco representative, or write us direct.

OTHER AMSCO PRODUCTS

DIGGING: backhoe buckets—dippers and parts—repointers—dragline bucket parts—dragline chain—sheaves—pinions.

CRUSHING: concaves—mantles—jaw plates—mill liners—hammers.

HANDLING: truck bed liners—grizzly parts—car wheels and liners—sheaves, gears, pinions.

WELDING: automatic and semi-automatic welders—hardfacing rod—manganese plates and shapes.

AMERICAN Brake Shoe COMPANY

AMSCO

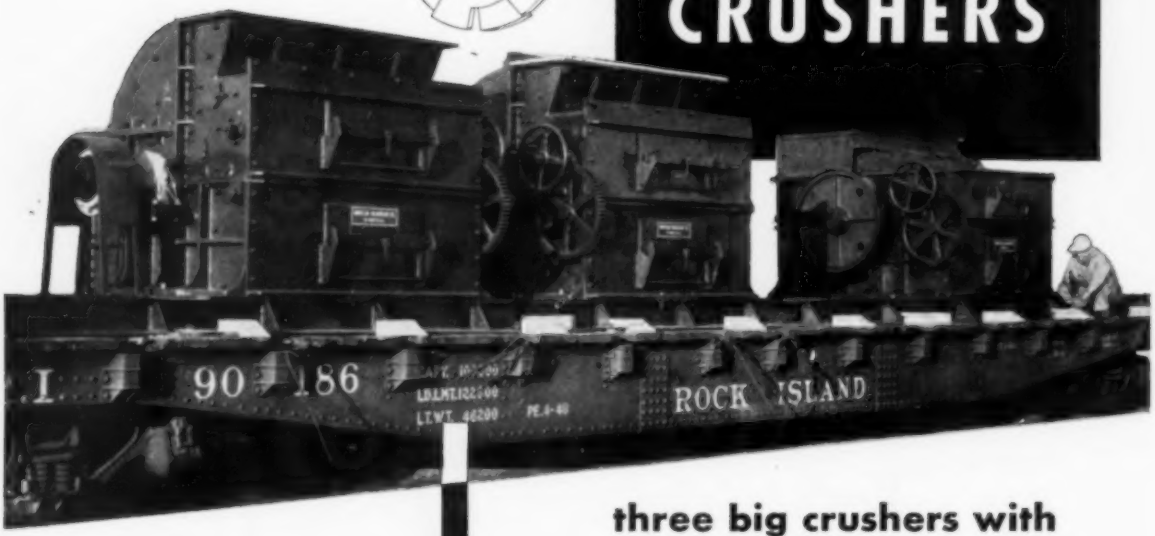
American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

on their way
to better
coal preparation

COAL IS SPLIT
-NOT CRUSHED

"AC"
ROLLING RING
COAL CRUSHERS



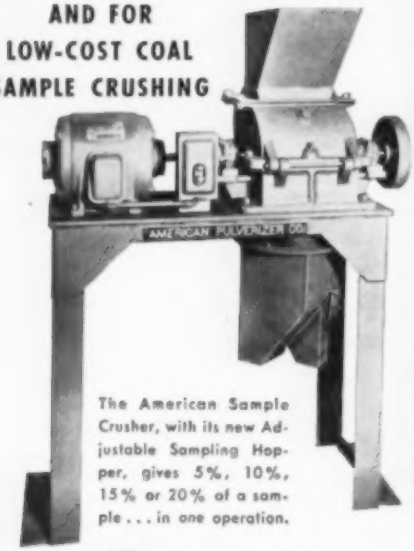
three big crushers with
the 'BIG THREE' advantages

1 **BETTER REDUCTION.** The exclusive American Rolling Ring reduction principle . . . designed to *split* coal instead of crushing it. Result: *controlled uniformity* in all coal reduction.

2 **HIGHER TONNAGE.** A "big appetite" (up to 800 t.p.h., depending on size of feed and product desired) in a *compact unit* with minimum headroom requirements for easier installation.

3 **LOWER MAINTENANCE.** Not a mere claim, but actual performance, backed by the operation records of scores of coal mines and power plants all over the country—records that prove Americans operate at a *total cost of less than 1¢ per ton of coal crushed!*

AND FOR
LOW-COST COAL
SAMPLE CRUSHING



The American Sample Crusher, with its new Adjustable Sampling Hopper, gives 5%, 10%, 15% or 20% of a sample . . . in one operation.

- ***WANT MORE INFORMATION***
  on better coal preparation?
  Write for Bulletin AC.

American
PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Ave., St. Louis 10, Mo.

"Easy as filling a coffee bag," say men who prepare supply of Akremite.

Simple and safe to store, Akremite can be mixed right at the mine location.

"How We Cut Blasting Costs 50%, Increased Output 20%, with New Akremite Process"

Spencer prilled Ammonium Nitrate is base for new simple, safe, low-cost explosive

We've found the new Akremite Blasting Process, now in use at our Cheshire, Ohio, operations, to be the ideal explosive for strip mining," reports F. H. Howe, Superintendent of Ohio River Collieries. "Because the ingredients are cheaper and the mixing process so much simpler, we have cut explosive costs 50% with Akremite. At the same time, better fragmentation produced by Akremite lets us move 20% more yards per month.

"The terrain in which we work is unusually difficult, but because Akremite is so safe and easy to handle, we still come out ahead."

☆ ☆ ☆

Akremite, the simple but revolutionary new explosive, is named after its inventor, R. I. Akre, superintendent of drilling at Maumee Collieries Co., Terre Haute, Ind. Akre uses prilled Ammonium Nitrate, produced by Spencer Chemical Company, as the base for his new explosive.

By itself, ammonium nitrate is not an explosive. But Akre found that if he mixed it with carbon black, packed it in a polyethylene bag, confined it in a drill hole and detonated it with a high gelatin dynamite and primacord, it produced a tremendous explosion.

Recently, an independent research organization put Akremite through a series of safety tests. They fired bullets into bags of freshly made Akremite. And they conducted the regular pendulum-friction and modified propagation-through-air tests.

Not a single explosion, fire or crackling resulted from any of these tests. Akremite with Spencer prilled Ammonium Nitrate is not only cheaper and better, but many mines report it is the safest strip mine explosive they have ever used.

(NOTE: Spencer Chemical Co. will be happy to provide you with further information about the Akremite Method as discussed by Mr. Howe.)

SPENCER CHEMICAL COMPANY

610 Dwight Building • Kansas City 5, Mo. • BAltimore 1-6600

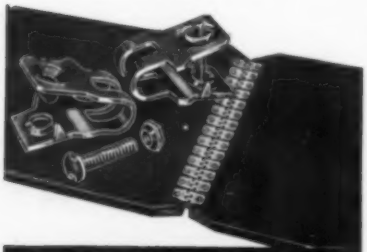
HINGED PLATEGRIP
BELT FASTENER No. 500

FOR HEAVY CONVEYOR BELTS OF CHANGING LENGTH

These heavy-duty belt fasteners make a strong, flexible joint in conveyor belts, belts of any width and of from 3/16" to 1/2" thickness. They offer special advantages in mines, quarries or industrial setups where length or position of belt is frequently changed, because sections can be removed or added at will. Joints are opened for this purpose by simply pulling out the hinge pin.

Easily and quickly applied on the job or in the shop. Special design gives deep compression into belting and smooth, flush joint.

Write for Circular



ARMSTRONG-BRAY & CO.
5340 Northwest Highway · CHICAGO 30, U. S. A.

Among the Manufacturers

Koehring Co., Milwaukee construction equipment manufacturer, has appointed L. J. Meyers to cover the south central area of the United States as district representative. Mr. Meyers will maintain contact with distributors of Koehring equipment as well as with those handling products of Parsons Co., Newton, Ia., and Kwik-Mix Co., Port Washington, subsidiaries of Koehring. His territory includes Illinois, Indiana, Kentucky, Tennessee, Missouri and Mississippi.

Maurice M. Muse has been appointed district sales representative for Leschen Wire Rope Div., H. K. Porter Co., Inc. His territory includes the eastern two-thirds of Kentucky and Tennessee and the northern half of Alabama.

Ralph C. Hanson, formerly with E. J. Lavino & Co., has joined the sales staff of the Ramtite Co., plastic castable and gunning refractories manufacturer. Mr. Hanson will work out of the company's Pittsburgh office as a special representative co-ordinating sales.

Fred Parsons has joined the sales staff of the Campbell Chain Co., York, Pa. Mr. Parsons will direct Campbell commercial, industrial and automotive sales in Ohio with headquarters in Cleveland. Before joining Campbell he was manager of the Cleveland office of the American Oil Filter Co.

M. Cleighton Hilbert, former plant manager of Crescent Industries, Chicago, Ill., has been made general manager of Duff-Norton Co.'s Coffing Hoist Div., Danville, Ill.

A. F. Dobbrodt has been named Pacific northwest sales representative of General Electric's Metallurgical Products Dept. (formerly Carboloy Dept.), Detroit. Mr. Dobbrodt will make his headquarters in Seattle. Considered an authority by General Electric on carbide cutting tools, Mr. Dobbrodt is responsible for a number of carbide cutter designs currently being used on automatic mining machines.

American Optical Co., Southbridge, Mass., has acquired J. W. Fecker, Inc., Pittsburgh producer of optical devices. The company will be operated as a wholly-owned subsidiary. Terms of the purchase were not disclosed.

Richard R. Branson has joined the St. Louis office of C & D Batteries, Inc., Conshohocken, Pa. Mr. Branson comes to C & D from the Emerson Electric Co.

Mine Safety Appliances Co., Pittsburgh, has formally acquired 100 acres of land near Cambridge, Md., as a plant site for the production of special batteries having national-defense applications. Building plans and land usage studies are in progress for the plant which is to be built in early 1957.

General Electric Co., Schenectady, N. Y., announces the formation of a special insulating materials section within the company's Chemical and Metallurgical Division with Louis E. Newman as section manager. The new organization is designed to integrate development activities so that new insulating products can reach the market faster, according to the General Electric announcement.

Davey Compressor Co., Kent, Ohio, has appointed Terence Caffrey to the position of chief engineer of the company's air compressor division with headquarters at Kent.

Twin Disc Clutch Co., Racine Wis., recently opened a new plant on a 22-acre Racine tract with formal dedication by Governor Walter J. Kohler of Wisconsin. The $2 million structure will be used for expanded production of models now turned out at the original Racine plant and at the Hydraulic Div. plant at Rockford, Ill. The new Twin Disc facility is

THE REEL SPIEL

THE PERFORMANCE SPEAKS FOR ITSELF

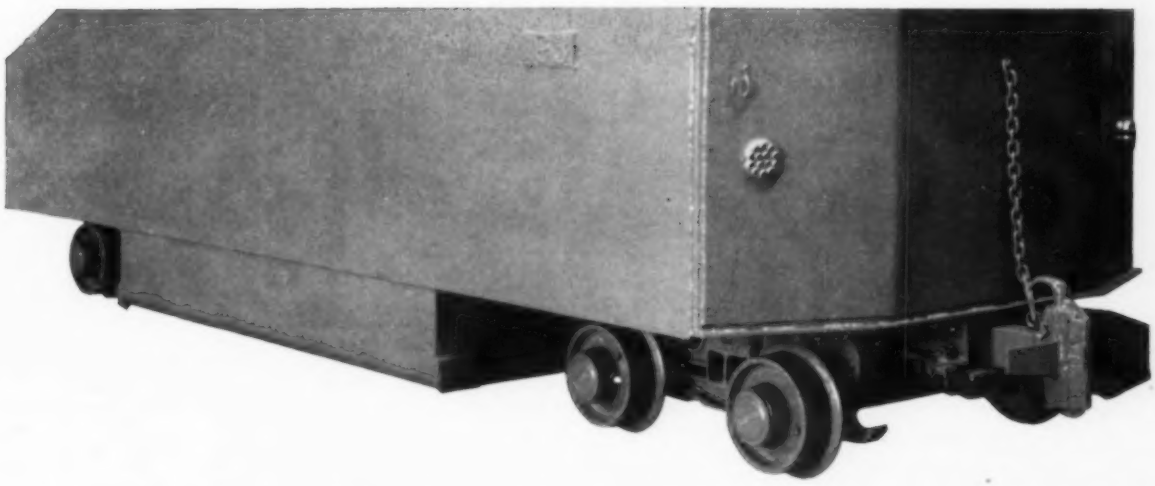
FLETCHER Roof Control Drills — when equipped with automatic hydraulic cable reel — make one-man roof bolting easier and faster than ever. Shift-after-shift in mine-after-mine FLETCHER drills deliver more bolts at lower cost than any other drill on the market. Write NOW for information on how YOUR mine can benefit from FLETCHER Drill efficiency.

- Jack-feed system delivers maximum smooth thrust with quick raise and return.
- Hydraulic lowering device lets you drill directly from the mine floor.
- Hydro-slide moves your drill across the place smoothly, accurately and fast.
- Compact frame and third-wheel steer makes tramming quick and easy.
- Height range from 28-inches to 14-feet lets you select a drill to exactly fit your mine.
- Telescoping mast gives full stroke in varying seam conditions. And the new floor-to-floor mast gives added safety, speed and power.

Fletcher ROOF CONTROL DRILLS

J. H. FLETCHER & CO. P. O. Box 353, HUNTINGTON 8, WEST VIRGINIA Phone 44186

Built for Heavy Loads and Hard Knocks



This is a husky 10-ton car, a bulldog that will take a lot of beating. It was designed by Bethlehem, made in the Bethlehem shops—and every inch of it is sound.

Features include all-welded body, cast-steel trucks and roller bearings, forged-steel wheels and axles, automatic couplers, and spring draft gear. The car is intended for rotary-dump service.

We recently delivered an entire fleet of units like this for a large-scale mining operation. The cars were designed, of course, to meet the requirements of that particular coal mine. Perhaps your own needs are altogether different; but whatever they are, Bethlehem is fully prepared to meet them with either end-dump or rotary-dump models. We can always give you a choice of welded or riveted construction, high- or low-side body styles, and four- or eight-wheel running gear.

Bethlehem engineers will gladly work closely with you on matters of car design and manufacture. When they can be of service, feel perfectly free to consult them. A letter or call will start the ball rolling.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

. . . A special form of Carbon ideally suited for industrial explosives is used in AKREMITE, new blasting medium developed and patented by the Maumee Collieries Co.
M-1 BLACK

AKREMITE *prepared with* M-1 BLACK

assures efficient, safe and economical results in strip mining. Millions of pounds have been shot to date without misfire or accident.

For perfect AKREMITE results, M-1 BLACK *is the carbon to use.*

Samples and Technical Data Furnished on Request to Licensees

R. T. Vanderbilt Co., INC. 230 Park Avenue • New York 17, N. Y.

Treat your coal and your customers with

SOUTHERN HOSPITALITY

Use "Southland", the *Better* Coal Spray oil that eliminates your spray troubles. Clean, Odorless, Blue Distillate, keeps your spray system clean and your customer contented.

THE SOUTHLAND COMPANY

YAZOO CITY, MISSISSIPPI Telephone • 1212

Manufacturers *(Continued)*

laid out to permit a five-fold expansion, as future needs dictate.

Union Carbide & Carbon Corp., New York, last month dedicated its new multi-million-dollar Parma, Ohio, laboratory for basic research in chemical and solid-state physics. The laboratory is operated and managed by the National Carbon Co. Division of Union Carbide.

Foreign News *(from p 160)*

500,000 tons in 1955 to an annual rate of 16,400,000 tons in the first 6 mo of 1956. Imports are expected to reach 18 or even 20 million tons for the whole year. Exports which totaled 6,300,000 tons in 1955 were cut down to 1,200,000 tons in the first half of 1956.

Domestic consumption rose 14% between the first half of 1955 and the corresponding period this year, while production rose only 2%.

There is an acute crisis of labor in the mines, the report stressed, but the solution to both labor and finance problems depends not only on the Coal Board but also requires a real government policy for fuel and power.

Despite the improvement in the market trend, the financial results in 1955 were unfavorable. Revenues rose from 280,000 million francs in 1954 to 292,000 million francs last year, but expenses increased by 16,000 million francs to 266,000 million francs, mainly because of higher labor costs.

The situation is expected to improve this year thanks to a relief of the collieries' financial burden pending a capital appropriation and a restricted price rise last July averaging 4%. This became necessary as the new wage increase granted December 27, 1955, will mean added charges of 8,000 million francs.

Coal output in 1955 totaled 57,400,000 tons and it is expected that this record figure will be exceeded by about 500,000 tons in 1956. At the present time, output has improved considerably and is judged one of the best in Europe.

Looking at the future, the report stated that though demand was always very active the threat of shortage would gradually diminish so that France would be able to cut down her imports again in 1957. In the long run, experts agree that the demand for coal, particularly coking coal, will remain keen whatever the competition may be from other sources of power.

JAPAN

A Japanese firm has contracted to buy 400,000 tons of coal worth £1,200,000 from China for the seven biggest iron and steel companies in Japan, according to an announcement by I. Hattori, managing director, Keimei Koeki Kabushiki Kaisha Tokyo. Mr. Hattori said his firm was authorized to purchase coal and iron ore from China, but China's iron ore price was too high.

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A SURE WAY

To Reduce Haulage Costs

Performance records of DART TRUCKS in open pit operations all over the country prove DART economy. This 60-SBDT DART Coal Hauler is powered with 400 H. P. Diesel driving through a torque converter. It carries 70 cubic yards (struck)—60 Ton payload. It has DART'S famous 80,000# tubular hitch with sealed oil reservoir, eliminating need for periodic lubrication.

***POWER* for the Climb—*SPEED* for the Haul Road**

SINCE 1903

DART TONNAGE ENGINEERED TRUCKS

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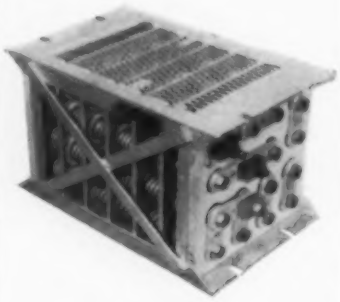
SUBSIDIARY OF THE CARLISLE CORPORATION

D-123

GUYAN RESISTORS



Above is a typical design of all GUYAN RESISTORS including standard boxes and mining equipment resistors.

• • •

STRATEGIC LOCATION OF GUYAN QUALIFIED DISTRIBUTORS TO COAL MINING INDUSTRY

Athens Armature & Machine Works — Athens, Ohio
Bluefield Hardware Company — Bluefield, W. Va.
Cambridge Machine & Supply Co. — Cambridge, Ohio
Close Distributing Company — Pittsburgh, Pa.
Erwin Supply & Hardware Co. — McClure, Va.
W. M. Hales Company — Chicago and Danville, Ill.
H. A. Holden, Inc. — Minneapolis, Minnesota
Keith Brokerage — St. Johns, New Brunswick, Canada
Kentucky Mine Supply Company — Harlan, Kentucky
Carl Liem — Wilkes-Barre, Pennsylvania
Mechanical Mining Service Co. — Morgantown, W. Va.
Mill & Mine Supply Company — Birmingham, Alabama
Mine Service Company — Lothair, Kentucky
R. M. Rogan — Middlesboro, Kentucky
Service Supply Company — Wheeling, West Virginia
Union Supply Company — Denver, Colorado
Universal Supply Company — Beckley, West Virginia

GUYAN MACHINERY CO.
LOGAN—WEST VIRGINIA

EQUIPMENT APPROVALS

Nineteen approvals of permissible equipment were issued by the U. S Bureau of Mines during August.

Joy Mfg. Co.—Types 10SC14BPF-2 (modified by SBM8839) and 10SC14-BPXF-2 (modified by SBM8768) cable reel shuttle cars; five motors, three 15 hp, two 7½ hp, 500 v, DC. Approval 2-1120A Aug. 3. (Approval 2-1120, covering 250 v shuttle cars of these types was issued Jan. 26, 1956.)

The Jeffrey Mfg. Co.—Type MM78-B Molveyor (sectionalized conveyor); twenty-seven motors, fourteen 1 hp and thirteen 5 hp, 230 v, DC. Approval 2-1161, Aug. 3.

Ensign Electric and Mfg. Co.—Type Single K distribution box with one 225-amp, 220-/440-v, AC circuit breaker. Approvals 2-1162 and 2-1162A, Aug. 14.

Ensign Electric and Mfg. Co.—Type KGG distribution box with one 225-amp and two 100-amp 220-/440 v, AC circuit breakers. Approvals 2-1163 and 2-1163A, Aug. 16.

J. H. Fletcher & Co.—Model DKE roof drill; one motor, 40 hp, 440 v, AC. Approval 2-1164A, Aug. 17.

The Jeffrey Mfg. Co.—Type 56-FHR drilling machine; one motor, 15 hp, 440 v, AC. Approval 2-1165A, Aug. 21.

Acme Machinery Co.—Model 130-4-R air compressor; one motor, 25 hp, 230 v, DC. Approval 2-1166, Aug. 21.

Acme Machinery Co.—Model 275 SPRHD air compressor; one motor, 50 hp, 550 v, DC. Approval 2-1167A, Aug. 22.

Joy Mfg. Co.—Type X-855-10 thirty-inch bridge conveyor; one motor, 3 hp, 250 v DC. Approval 2-1168, Aug. 24.

Joy Mfg. Co.—Model I-21 portable fan; one motor, 5 hp, 220 v, AC. Approval 2-1023, Aug. 28. (Approval 2-1023A covering 550 v fans of this type was issued Oct. 28, 1954.)

Long Co.—Type PT Piggyback conveyor; one motor, 5 hp, 230/500/550 v, DC. Approvals 2-1169 and 2-1169A, Aug. 29.

Joy Mfg. Co.—Types 9SC2BPF-1 (modified by SBM8891) and 9SC2B-PXF-1 (modified by SBM 8892) cable reel shuttle cars; three motors, each 15 hp, 500 v, DC. Approval 2-1057A, Aug. 30. (Approval 2-1057, covering 250 v shuttle cars of this type, was issued April 14, 1955.)

Caterpillar Tractor Co.—Type 955 Traxcavator diesel shovel for use in noncoal mines. Approval 2408, Aug. 3.

DODGE PRODUCTS You Should Know—

TAPER-LOCK SHEAVES

AIR-GRIP CLUTCHES

TAPER-LOCK ALL STEEL CONVEYOR PULLEYS

Dodge Bulletins you should have—

☒ Taper-Lock All Steel Conveyor Pulleys. Construction details, sizes, dimensions. Bulletin D56.

☒ Technical data and selection tables for Air-Grip, Diamond D, Rolling Grip Clutches. Bulletin D56.

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Gravity flow of mine water from a high sump to a low sump through two four-inch diameter lengths of NATIONAL Polyethylene Pipe.

USS NATIONAL* Polyethylene PIPE

CORROSION, one of the major destructive forces of a coal mine's atmosphere, has no effect on NATIONAL Polyethylene Pipe. It is resistant to most acids, alkalis, salts and a wide variety of other chemicals. Thus, you can install it and forget about it.

NATIONAL Polyethylene Pipe is tough, too. Rough handling won't crack it, even at low temperatures. And it remains rugged and flexible over its entire working range from minus 90°F. to plus 120°F.

Light and flexible, polyethylene pipe unrolls like hose, making it extremely easy to install. And, since it will turn corners and go over or under obstructions, few joints are necessary. However, when a connection is used, the pipe is easy to cut and the insert-type fittings are quickly secured with stainless steel clamps. Ells, tees, couplings and reducers are available to suit any layout.

Manufactured from pure 100% "on grade" polyethylene raw material, NATIONAL Polyethylene Pipe is available in sizes from ½-inch to 6 inches in diameter, in a variety of wall thicknesses. For complete information on the use of NATIONAL Polyethylene Pipe, write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

*Trademark

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

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UNITED STATES STEEL

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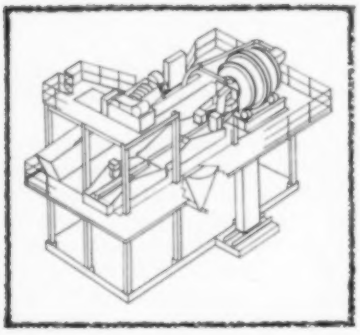

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Books For Coal Men

Mine Safety

Injury Experience in Coal Mining, 1952, by Seth T. Reese, Virginia E. Wrenn and Elizabeth J. Reid, is an analysis of mine safety factors, related employment and production data. Information is broken down as follows: general injury experience; selected data; experience by states; major disasters, and historical fatality experience. *60 pp. 8x10½-in; paper. 35 c. Bulletin 559, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.*

Direct Current

Why D-C? describes in layman's terms why DC apparatus is so widely used throughout industry. Examples are cited for each of the application areas for DC drives. *Direct Current Motor and Generator Dept., General Electric Co., Erie, Pa.*

Synthetic Fuels

Synthetic Liquid Fuels Annual Report of the Secretary of the Interior for 1955 covers the Bureau of Mines research work for producing gasoline and other materials from coal and oil shale. The work is issued in two volumes, one on coal and the other on oil shale. *Part I—Oil From Coal, R.I. 5236; Part II—Oil From Oil Shale, R.I. 5237. An unnumbered summary of the whole synthetic program also is available. Bureau of Mines, Publications-Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

Coking Coal Surveys

The following publications by the U. S. Bureau of Mines on coal reserves may be obtained free upon request to *Publications-Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. All are 8x10½-in; paper; mimeo.*

Tennessee: Anderson County, R. I. 5185; Van Buren County, R. I. 5208; Bledsoe County, R. I. 5234; Claiborne County, R. I. 5229; Scott County, R. I. 5232; Fentress County, R. I. 5235.

West Virginia: Marshall County, R. I. 5207; Monongalia County, R. I. 5233.

Pennsylvania: Clarion County, R. I. 5231.

Rock Dusting Facts

Rock Dusting and Sampling, Including Wet Rock Dusting at the Bureau of Mines Experimental Coal Mine, by Dr. Irving Hartmann and James Westfield. This report describes facts and fallacies concerning the use of rock dust to prevent coal-mine explosions. *I.C. 7755. 8x10½-in; paper, mimeo. Bureau of Mines, Publications-Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

Preventing Belt Fires

Safety Aspects of Controls and Operations of Belt Conveyors in Coal Mines, by C. L. Brown. This report describes safer methods for installing and operating conveyor belts to combat the hazard of underground fires. *I.C. 7749. 8x10½-in; paper; mimeo. Bureau of Mines, Publications-Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

Electronic Blasting Research

Mobile Laboratory for Recording Blasting and Other Transient Phenomena, by T. C. Atchison, W. I. Duvall and Leonard Obert, describes the mobile laboratory used by the USBM to obtain photographic evidence of the strains and vibrations produced in rock during mine and quarry blasting. *R.I. 5197. 8x10½-in; paper; mimeo. Bureau of Mines, Publications-Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

Coal Strength

A Study of the Ultimate Strength of Coal as Related to the Absolute Size of the Cubical Specimens Tested, by Frank L. Gaddy. This bulletin describes laboratory tests made to determine the relationship between the size of test cubes and their ultimate strength. The study was made to supply some information on the relationship between the strength of a laboratory specimen and a mine pillar. *Engineering Experiment Station Series No. 112. 27 pp. 6x9-in; paper. 25c. Virginia Polytechnic Institute, Blacksburg, Va.*

Alaska Coal

The Wishbone Hill District, Matanuska Coal Field, Alaska, by Farrell F. Barnes and Thomas G. Payne. An up-to-date report on the geology, coal resources and mining activities of the Matanuska Coal Field.*Geological Survey Bulletin 1016. 88 pp plus maps. 6x9-in; paper. $2.50. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.*

Arcwelding Safety

Always on the Job is a 20-min sound slide film covering the basic principles of safety in arcwelding, and features the light, cartoon approach to the topic. *Free loan or may be purchased for $15. Air Reduction Sales Co., Div., Air Reduction Co., Inc., 150 East 42nd St., New York 17, N. Y.*

Ohio Minerals

The following useful publications may be obtained from the *Ohio Geological Survey, Orton Hall, The Ohio State University, Columbus 10, Ohio:*

The Ohio Landform Map showing hills, valleys and other landforms of the state. *Single copy free.*

The Mineral Industry Map of Ohio, compiled by Robert W. Smith, shows locations of mines and quarries of Ohio operating in 1955. Scale 1 in equals 8 mi. *Free.*

Bituminous Coal Production in Ohio by County, 1800 to 1955, by Marion S. Klein, compiles statistics from numerous sources to show production for the past 155 yr. *15x30-in. Free.*

WIRE ROPE TALKS

SUBJECT:

STORING WIRE ROPE OUTDOORS

Practical hints on the use and care of wire rope by Robert M. Kilian, Chief Engineer of Leschen Wire Rope Division, H. K. Porter Company, Inc.

QUESTION:

What is the best method of storing wire rope outdoors?

ANSWER:

If you think of wire rope as a machine of many parts built to close tolerances, you quickly understand why it should be protected from outside exposure, particularly from weather that involves dampness or humidity. Extended exposure under severe conditions will impair wire rope to the point of substantially reducing its effectiveness. After idleness and lack of care it may be of little use.

For example, rust tends to bind wires together so they are not free to move back and forth. Then they fail to adjust themselves when lifting or pulling a load. They do not move properly in operation around sheaves.

Lubrication and Cleaning

The outer layer of new wire rope to be stored on its shipping reel should be covered with a heavy protective lubricant. A generous application will tend to protect the entire length. "LePro" Wire Rope Protector, a Leschen product, is especially formulated for this purpose. You apply it cold, and it goes on quickly with a brush or by pouring slowly from a can.

Wire rope removed from service, to be stored for future use, should be cleaned thoroughly with a wire brush, compressed air, or superheated steam. Then lubricate it first with a penetrating lubricant that will coat all strand wires, internally as well as externally. Next coat the rope with "LePro" to seal in the other lubricant and repel penetration of moisture and fumes. Finally, wind the used rope on a reel, rather than let it lie loosely on the floor or ground.

Following lubrication with "LePro" it is advisable to cover the rope on the reel with waterproof or tar paper. Seal the paper at the flange with "LePro". If a number of reels are stored at one spot, cover the entire group with a tarpaulin.

Taking proper care of high-quality products like HERCULES Red-Strand wire rope is as important as selecting them in the beginning. You are money ahead on both counts.

Storing and Re-Use

Select a storage area that is clean and dry, and as well protected from the weather as possible. Avoid nearby acid fumes or other corrosive agents. They can cause embrittlement of the surface of the wires. Reels should not rest directly on the ground. Place them on wood or metal supports.

When rope is returned to service, excess lubricant can be wiped off as the equipment is run slowly. Lubricants may pick up some dirt later, but this will cause far less damage than would the leaching effect resulting from the use of a solvent for cleaning.

The higher-than-rated quality built into Leschen wire rope is well worth preserving by proper storage methods. To obtain this quality in the first place remember to specify the rope with a RED STRAND—the symbol of highest quality wire rope for seventy-five years.

A Leschen district warehouse or distributor is nearby. See them for other rope-saving suggestions—and for HERCULES Red-Strand Wire Rope.

Reprints of this "Wire Rope Talks" are available on request

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LESCHEN WIRE ROPE DIVISION
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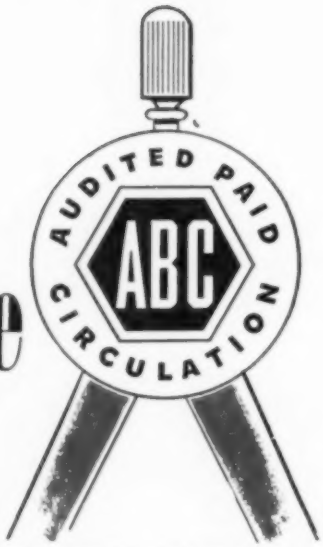

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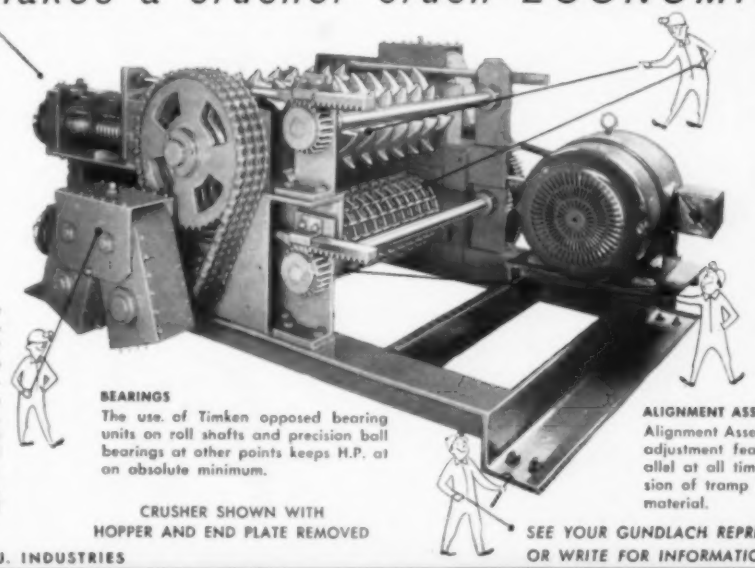

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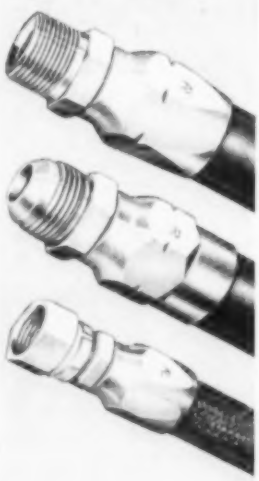

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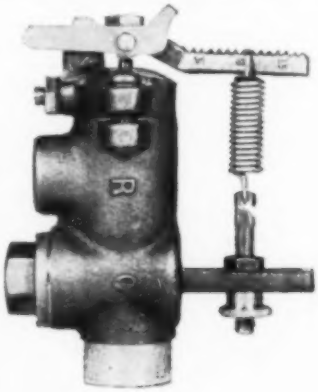

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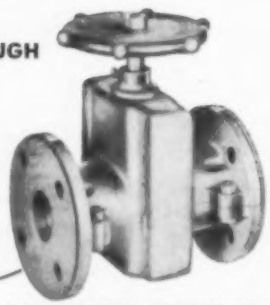

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Henry W. Oliver Bldg. — Pittsburgh, Penna.

EAVENSON, AUCHMUTY & SUMMERS
Mining Engineers
COAL OPERATION CONSULTANTS
VALUATION
2720 Koppers Bldg. — Pittsburgh 19, Pa.

J. B. MORROW
Coal Consultant
Oliver Building — Pittsburgh, Pa.

PAUL WEIR COMPANY
Mining Engineers and Geologists
Consultants and Managers
DESIGN and CONSTRUCTION
20 North Wacker Drive — Chicago 6, Illinois

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
$1.20 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
POSITION WANTED undisplayed advertising rate is one-half of the above rate, payable in advance.
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Send New Advertisements or Inquiries to Classified Advertising Div. of Coal Age, P. O. Box 12, New York 36, for November issue closing Oct. 18th

EXCELLENT OPENINGS FOR MINE EQUIPMENT DEVELOPMENT ENGINEERS

A principal supplier of essential products for the mining field is seeking men with electrical, mechanical, or mining engineering training, plus some experience in coal mining operation. Positions involve product development and field study of mining equipment.

Excellent opportunities exist for advancement with a company of the highest standing in its field, located in a Northern Ohio community where working and living conditions are exceptional.

Preferable age bracket is in the 25-35 year range. Some traveling will be required. Please give us a review of your educational and experience background, as well as any personal facts which you feel would pertain to prospective employment. A general statement as to salary requirements is desired. We assure you that all correspondence will be held in strict confidence.

P-3010 COAL AGE
Class. Adv. Div., P.O. Box 12, New York 36, N.Y.

REPLIES (Box No.): Address to office nearest you c/o this publication, Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITION VACANT

Mining Engineer required as a Mine Superintendent of an underground gypsum operation. Attractive surroundings and living conditions in the heart of New York State's Finger Lakes Region. Position is of a supervisory nature with a minor amount of engineering required. Mine is completely mechanized with most modern equipment available. Apply stating qualifications, experience, marital status, age, salary expected to The Ruberoid Co., Caledonia, N.Y.

SELLING OPPORTUNITY OFFERED

Old established Michigan Wholesaler has opening, with splendid opportunity for experienced industrial and domestic salesman, age 35-45, familiar in handling W. Va., Kentucky and Ohio coals, marketed principally in Michigan. Prefer man qualified to take charge. Give details and references in first letter. RW-2854, Coal Age.

POSITIONS WANTED

Safety Engineer: position wanted in safety, personnel or related duties. 20 years experience in mining and heavy industry. Thoroughly experienced, with successful background. Married, age 43. Available on short notice. PW-3033, Coal Age.

Coal Mine Engineer-Manager. 20 years experience all phases of coal mining in Western Pennsylvania and Alabama with progressive companies. Graduate Professional Engineer. PW 2943, Coal Age.

BUSINESS OPPORTUNITY

Wanted Coal operator to strip coal on this and adjacent farms. The coal is Cambridge #7 5 to 6 ft in height. Cover is 15 to 20 to 80 ft. Write Albert H. Smith R.R. Byesville, O. Phone 5153.

WANTED

Anything within reason that is wanted in the field served by Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

FOR SALE OR LEASE

Modern deep mine and contiguous low volatile acreage located in Central Pa.—"C" Seam. Mine equipped and in condition for immediate operation. Loading on NYC—Shipments also via PRR.

BO-2964 Coal Age
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

West Virginia Coal Mine
3 million ton C & O Ry. low volatile high grade by Product
Box 2958 — Coal Age
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

PIPE 4", steel, heavy duty, 3,000 ft.; 100 ton railroad scales; Mining Machines, 312AA Goodman, 10B Sullivan; Mg Sets 200 & 75 KW; Railroad Hoist, 9,000 # line pull, 96 fpm; Conveyor, apron feeder 36" width, 80' centers; 3' x 6' Single deck Simplicity Screen.

MOSS COAL & MINERAL CO.
705 North 9th Street, Birmingham, Ala.

FOR SALE
1 — new 1000 ton
CONCRETE STAVE BIN.
Never erected.
RALEIGH EAGLE COAL CO.
Ameagle, W. Va.
Telephone: Whitesville 3171

WANTED
STRIPPING SHOVEL
22 TO 45 YARDS
FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

MOTOR-GENERATOR SETS
500 KW. GE. 275 V.-2300 V.
300 KW. GE. 275 V.-4000/2300/440 V.
300 KW. Westgh. 275 V.-2300/440 V.
300 KW. Westgh. 550 V.-2300/440 V.
300 KW. Ridg. 275 V.-2300 V.
200 KW. GE. 275 V.-4000/2300 V.
150 KW. GE. 275 V.-2300/440 V.
150 KW. GE. 550 V.-2300/440 V.
100 KW. Westgh. 275 V.-2300/440/220 V.
75 KW. Westgh. 275 V.-440/220 V.
50 KW. Westgh. 250 V.-440/220 V.
A.C. & D.C. MOTORS - TRANSFORMERS
COMPRESSORS - PUMPS - HOISTS
MOORHEAD ELECTRICAL MACHINERY CO.
OAKDALE, PA. OWENS 3-6401
(Pittsburgh District) Walnut 1-4300

850 HP WSM Hoist 12' x 12' Single Drum all controls.
Vulcan 600 HP Hoist 10' x 10' Drum Elec. & Safety controls.
Joy 10 RU Cutter on Rubber 440 Volt AC power.
Joy JCM 3 Continuous Miner Serial in 280.
Jeffrey 29 CE Cutting & Shearing Mach. on Cats 250 V.
Manitowac 4500 Dragline & 3500 Shovel.
Sanford Day ST Drop Bottom Mine Cars 42 ga. 39" H.
T. L. SIMPSON, MCHY. AGENT
1296 Woodbourne Ave.
Pittsburgh 26, Pa. LEhigh 12254

Walking draglines, 200W, 6W, 5W, 4W, 6160.
Locomotives diesel, gas. 10 to 80 tons.
Tugboat, 69' steel, 500 HP, G. M. diesel.
Euclid diesel 15-22 ton end dump trucks.
Kilns, dryers, 9 x 140, 10½ x 101, 7 x 110, etc.
Shovels, Lima 1201, P&H 1055, Bucyrus 120B.
Cranes, shovels; elec., diesel, 2½ to 23 yds.
H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wis.

WE DID IT THE HARD WAY

Some folks spend millions on advertising and make a name for themselves almost over-night. We made our reputation the hard way—it took years of buying and selling Mining Equipment to teach folks to say "You can ALWAYS depend on J. T. FISH!"

WE OWN WHAT WE ADVERTISE

Buy from the largest stock of good mining equipment in America. Includes all types of Joy Cutters, Loaders, Shuttle Cars, Cat Trucks, Belt Conveyors, Chain Conveyors, etc.

JOY EQUIPMENT — rebuilt

3—Joy 20-BU Loaders, latest type.
3—Joy 14-BU Loaders, low pedestal.
3—Joy 12-BU Loaders, 9E, latest type.
2—Joy 12-BU Loaders, 7E, excellent.
6—Joy 8-BU Loaders.
3—Joy 11-BU Loaders.
5—Goodman 660 Loaders on Cats, excellent.
6—Joy 6SC Shuttle Cars, lowest type.
2—Joy 32E9 Shuttle Cars.
2—Joy 32E10 Shuttle Cars.
2—Joy 32E15 Shuttle Cars.
1—Joy T-1 Standard Cat Truck.
1—Joy T-2-5 Cat Truck, AC.
5—Joy T-2-5 Cat Trucks, 250 volt DC.
4—Joy 11-B Cutting Machines, like new.
1—Joy 7-B Cutting Machine, excellent.
2—Goodman 512 Cutting Machines with Buggdusters, like new.
6—Goodman Machines on Cats, 31" high. All hydraulic.
1—Goodman 512 Cutting Machine, perfect.
3—Jeffrey 29UC Cutting Machines, cat mounted, perfect.

LOCOMOTIVES

2—Jeffrey, 20 ton, type MH-110, 42" and 44" Ga.
4—Jeffrey, 13 ton, type MH-110, 36", 42" and 44" Ga.
3—Jeffrey, 10 ton, type MH-78, 42" and 48" Ga.
12—Jeffrey, 6 ton, type MH-88, 42", 44" and 48" Ga.
3—Jeffrey, 4 ton, type MH-96, 42", 44" and 48" Ga.
1—G.E., 4 ton, type 825, Locomotive, 26" high.
10—G.E., 6 ton, types 801, 803, 821, Locomotives, 42", 44" and 48" Ga.
1—G.E., 8 ton, type 822, Locomotive, 44" Ga.
3—G.E., 10 ton, type 809, Locomotives, 42", 44" and 48" Ga.
1—G.E., 10 ton, 829 Locomotive, 36" Ga.
1—Goodman, 4 ton, 8-30 Locomotive, 22" above rail.
8—Goodman, type 33, 6 ton, 44" and 48" Ga.
3—Goodman, 8 ton, type 32A, 36", 44" and 48" Ga.
3—Westinghouse, type 902, 4 ton, 42" and 48" Ga.
2—Westinghouse, type 904, 6 ton, 44" and 48" Ga.
2—Westinghouse, type 906, 44" and 48" Ga.
2—Westinghouse, type 907, 10 ton, 44" and 48" Ga.
2—36" Ga. Battery Locomotives.

TIPPLE EQUIPMENT

1—Cedar Rapids portable super Screening Plant.
1—Allis Chalmers 5' x 14' Ripplo Vibrator.
1—4' x 10' Robbins Gyrex Vibrator.
1—4' x 14' Vibrator, three deck, low head.
Feeders, Drag Conveyors, and Loading Booms.

CUTTING MACHINES

3—Jeffrey 29UC Universal, on cats.
2—Goodman 212, G-3, AC, Low vein.
4—Baby Goodman 212's, rebuilt.
3—Goodman 312's, 18" high.
2—Goodman 412's, 18" high.
2—Goodman 512's with Buggdusters, like new.
15—Goodman 12AA's and 112AA's.
10—Goodman 324 Stabbers.
2—Goodman 724 Stabbers.
30—Jeffrey 35L's, like new, 17" high.
15—Jeffrey 35B's and 35BB's.
2—Jeffrey 29B's on track.
2—Jeffrey 29C's, track mounted.
2—Sullivan CR-10's, 15" high.

LOADING MACHINES

17—Joy Loaders, all types.
2—Jeffrey 61 CLR's on rubber, 26".
1—Jeffrey L-500 Loaders.
3—Meyers Whaley No. 3 Automat Loaders.
3—Clarkson Loaders, 26" above rail.

CONVEYORS

2—Joy 30" Belt Conveyors, 10 to 15 H.P.
2—Goodman 97-G's, 26".
3000' 30" Conveyor Belt.
8—Jeffrey 61 AM Room Conveyors, 300 ft.
10—Jeffrey 61 HG Face Conveyors.
5—Room Conveyors, type 400, 300 ft.
2—61EW Elevating Conveyors.
2—61 WH, 15" Room Conveyors, 300 ft.
4—Joy Ladel UN-17 Shakers.
10—Goodman G-12½ and G-15 Shakers.

CONVERTERS AND DIESEL PLANTS

3—100KW, G. E., TCC-6's, 275 volt, Rotary Converters.
3—150KW, G. E., HCC-6's, 275 volt, Rotary Converters.
1—200KW, G. E., HCC-6 Rotary Converter, 275 DC.
3—300KW, G. E., HCC-6 Rotary Converters, 275 DC.
1—200KW Westinghouse Rotary Converter, 275 DC.
1—300KW Westinghouse Rotary Converter, 275 DC.
1—500KW Westinghouse Rotary Converter, 275 DC. (All the above with 6900/13800 and-or 2300/4000 primary transformers)
2—150KW MG Set, G. E. and Westinghouse.
1—200KW MG Set, General Electric.
1—300KW MG Set, General Electric.
1—500KW MG Set, General Electric.
1—Cummins 125 KW, 250 volt DC.
1—700 H.P. Shaft Hoist, complete.
Complete steam plant, will sell all or any part.
Boilers, like new, 1100 H.P. and 500 H.P. Also transformers, turbines, etc.
Complete Tipples with Cleaning Plants.

MISCELLANEOUS

10—Air Compressors, 1 H.P. to 40 H.P.
40 Mine Pumps, all types.
Pipe, Plastic, Steel Transit, all sizes, 1" to 6".
15 Mine Cars, drop bottom, 42" Ga.
90 Mine Cars, End dump, 36" Ga.
150 Mine Cars, 18" high, end dump, 44" Ga.
300 Mine Cars, end dump, 20" high, 48" Ga.
15—Brown Fayre HKL and HGD Car Spotters.
1—12 ton Differential Slate Larry.
4—Overhead Bridge Cranes.
1—Kanawha Hillside Dump.
5—Low vein Water Cars.
Incline Hoists, 25 to 50 H.P.
Machine Tools for mine shops.
400 tons Rails, all sizes.
10 tons Copper Trolley and Feeder.
300 Transformers from 1 to 2,000 KVA, 110 to 13,000 Primary Volts.
400 Electric Motors, 3 to 200 H.P.
Suspension Bridge, 300 ft. long, for river crossings.
1—International TD-24 Angledozer.
Huge stock of mine supplies.

Thousands of other Items. **Send Us Your Inquiries.** **We Originate.** **Others Imitate.**

J. T. FISH & COMPANY

Logan, W. Va. **Phone 2825**

Save on Your

INDUSTRIAL TRACK

FOSTER QUALITY — **FULLY GUARANTEED**

RELAYING RAILS

Handle more cars better—cost less to install and maintain. Foster stocks all Rail Sections 12# thru 175#, Switch Material and Track Accessories.

SEND FOR CATALOGS

RAILS - TRACK EQUIPMENT - PIPE - PILING

L B FOSTER co.

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

HYDROMATIC BRAKES

(2)—manufactured by The Parkersburg Rig And Reel Co. Type "S"—size 32"—15 PSI—720 RPM—4000 HP—5" shaft diameter.

EQUAL TO NEW—TEST RUN ONLY

The Boston Metals Co.
313 E. BALTIMORE STREET
Baltimore 2, Md. • Lexington 9-1900

BOX CAR LOADERS

3—Ottumwa 20 HP box car loaders
2—Manierre 22 HP box car loaders
1—Jeffrey 20 HP box car loader
2—Red Devil portable loaders, 12" x 15"
1—Card portable loader, 11' x 19"

ROTARY DUMPER

1—Card Rotary car dumper, 13" x 15' platform

ELECTRIC HOISTS

1—11 HP Vulcan, single drum
1—20 HP Vulcan, single drum
1—22 HP Vulcan, double drum
1—25 HP Vulcan, single drum
1—30 HP Vulcan, single drum
1—37 HP single drum
5—50 HP single drum
2—60 HP single drum
1—75 HP Vulcan Double Drum
4—100 HP Box single drum
1—112 HP Vulcan, single drum
1—150 HP Vulcan, single drum
2—125-200 HP Ottumwa single drum
1—250 HP Ottumwa single drum

RAIL

12—90# Rail, new and used, in stock, with fittings

LOADERS & CONVEYORS

3—5 BU Joy loaders, 250 V. D.C.
1—61EW Jeffrey elevating chain conveyor
1—61HG Jeffrey chain conveyor, 90'
1—61W Jeffrey chain conveyor, 200'
8—G-20 Goodman shakers
6—G-15 Goodman shakers
8—Vulcan shakers
1—UN-17 Joy LaDel shaker
10—Goodman HA duckbills

MINING MACHINES

A.C.

1—7B Sullivan super shortwall
16—Sullivan CE7
1—28A Jeffrey
5—112A Goodman

D.C.

3—7B Sullivan super shortwall
2—T-1 Joy crawler type trucks

SCALES

3—100 ton Fairbanks railroad scales
1—125 ton Howe railroad scales

COAL CARS

88—66 cu. ft. Card steel, end dump, 36" ga.

SHUTTLE CARS

1—Joy model 6DD3P, battery operated
7—Joy model 6DD1, battery operated

MINE FANS

1—120" Joy La-Del axial flow fan, model L-14
1—8H Jeffrey 42" aerodyne fan
1—7" Jeffrey aerodyne 2 stage fan

BATTERY LOCOMOTIVES

1—4 ton Westinghouse, 24" ga.
1—4 ton Ironton, 36" ga.
2—6 ton General Electric, 36" ga.
2—7 ton General Electric, 36" ga.
3—8 ton Ironton, 36" ga.
2—8 ton General Electric, 36" ga.
2—8 ton Goodman, 36" ga.
1—10 ton Atlas, 36" ga.

TROLLEY LOCOMOTIVES

1—4½ T. Goodman, 36" ga.
1—5 T. Jeffrey, 36" ga.
1—6 T. Goodman, 36" ga.
1—6 T. Goodman, 42" ga.
2—8 T. Goodman, 42" ga.
3—10 T. Jeffrey, 42" ga.
1—13 T. Goodman, 42" ga.
1—13 T. Jeffrey, 42" ga.
3—15 T. Jeffrey, 42" ga.

MOTOR GENERATOR SETS

1—7 k.w. General Electric 125 V. DC — 440 V. AC
140 k.w. Imperial 250 V. DC — 440 V. AC
1—75 k.w. Lidgeway 125 V. DC—2300 V. AC

COAL CRUSHERS

1—18" x 18" Jeffrey Single Roll
1—30" x 30" Jeffrey Single Roll

ROCK DUSTERS

1—M.S.A. type A, 2 HP 250 V. DC motor
1—M.S.A. type A, 440 V. AC motor
1—M.S.A. 2S-1103, 20 HP 230 V. DC motor

We have been authorized by the United States Bureau of Mines to repair and rebuild permissible equipment and to replace and affix permissible plates within existing requirements.

Since 1898 Dependable Reconditioned Machinery

Send for new reconditioned stock list catalogue 561-C.

MORSE BROS. MACHINERY CO.

2900 BRIGHTON BLVD. **EST. 1898** **DENVER 1, COLO.**

SEARCHLIGHT SECTION

MINE BELT CONVEYOR—4500 feet of 42" channel type for Slope or Tunnel. Timken Bearing Carrying and Return Idlers. 9 sets of Drives complete w/100 and 150 H.P. Motors, Gear Reducers, Head, Tail and Takeups plus all fixtures. Belting is 42" AIH Quality. 6 ply ¼" Top Cover, Breaker Strip, 42 oz Mildew Proof in continuous rolls of approximately 1050'.

The above is top quality equipment with very little wear. Belting is extra nice, some looks like new. System was used about 1½ years above ground Located Central Arkansas. Write phone or wire:

K. K. SEYLER Care of S. E. EVANS Contractor

2914 North "O" St. P.O. Box 903 Ft. Smith Arkansas

FOR SALE

A.C. & D.C. DIESEL GENERATOR SETS

A.C. SETS

(3) 200 KW G.M. model 8-268A—8 cyl.—air starting—6½ x 7—heat exchanger cooled—driving Westinghouse generator—200 KW 440/3/60—1200 RPM—with direct connected exciter and complete with panel board for generator, engine starting air compressor and starting air tanks. Reconditioned by U.S. Navy. Units in excellent condition. Price on request.

(40) NEW AND TEST RUN ONLY—BUILT 1953 20 KW—120/208—3 phase 60 cycle 1800 RPM 4-wire ball-bearing E.M. generators with voltage regulator. Excitation 0.75 KW—62.5 volts—12 amps. ENGINE: Sheppard Model 6D—4½ x 5—3 cyl.—radiator cooled—212.8 cu. inch displacement—self-contained fuel tank—steel I-Beam base—12 volt heavy duty starter. Full generator rating 5000 to 8000 ft. Above 8000 ft. loss of 3% per 1000 ft. BARGAIN PRICE $2095.00 EACH!

D.C. SETS

30 KW—120 volt DC—Sheppard model 12—6 cyl.—4 x 6—50 HP at 1200 RPM—continuous full load rating—radiator cooled—built to ABS & AIEE #45—class A insulation—electric starting. GENERATOR: 30 KW—120 volts DC—250 amps—shunt wound—40° rise.

THE BOSTON METALS CO.
313 E. BALTIMORE STREET
Baltimore 2, Md.—Lexington 9-1900

COAL RECOVERY DRILLS

McCarthy Coal Auger Drill, 36" Augers, G.M.C. diesel engine, one (1) yr. old.

Compton 42" Coal Auger Drill, Cummins diesel engine. Like New.

FRANK FAMALETTE EQUIPMENT COMPANY
P. O. Box 325
Hazleton, Pa. GL 5-4708

FOR SALE
One 22 HD Sullivan Core Drill
Complete with power unit; excellent condition; Priced for immediate sale. Contact
Monongahela Machinery and Equipment Co.
Box 250, Monongahela, Pennsylvania

FOR SALE

Peerless Brand New Submersible Pumps 250 GPM at 47 foot head, Brass construction with 75 foot cable, check valve, strainer and controller. Outlet for 2½" Hose. 4 H.P.—230 Volt DC. Dimension—9" Diameter x 29" long. Government Cost $991.00 ea.

Price—$125.00 ea. F. O. B. West Trenton or Ogden, Utah

FRANKLIN MACHINE PRODUCTS CO., INC.
WEST TRENTON, NEW JERSEY

4500 MANITOWOC DRAGLINE BARGAIN AT $75,000.00

140' Boom 4 Yd. Bucket
D386 Caterpillar Diesel
Excellent Condition
Pennsylvania Location

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

ROOF-BOLTING OUTFIT

Complete with Acme Track-Mounted 160 cu. ft. Compressor
SJ173-32RX Stopper Arm Complete
DK280-50X Dust Collector
S11DCS Single Offset Dust Collector Stopper
(The above is all new equipment)

CONTACT
THE BELDEN BRICK COMPANY
P. O. BOX 910—CANTON 1, OHIO
PHONE: GLendale 6-0031

NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Tons 18" to 56½" Track Gauge.
GREENBURG MACHINE CO.
Greenburg, Pa.

FOR SALE

44—All-steel rotary dump mine cars ACF, 12' x 6' x 3', 4 ton, 42" gauge.

Call or write:
WESTERN POCAHONTAS CORP.
P. O. Box 509, Huntington, W. Va.
Phone: 28268

MIDWEST STEEL CORP.
550 DRYDEN ST., CHARLESTON, W VA.

THE BEST IN MINING EQUIPMENT

TRACKLESS EQUIPMENT

(W) 1—6SC Joy Shuttle Car
(C) 2—6SC 5E Joy Shuttle Cars, Elevating discharge
(W) 2—5SC Joy Shuttle Cars Late Models
(W) 1—5BC 1CF 500 Volt Joy Shuttle Car
(C) 2—32E7 Joy Shuttle Cars
(W) 4—32D Joy Shuttle Cars
(C) 1—Lee Norse Shuttle Car
(C) 1—T2-6 Joy Cat Truck—Like New
(C) 1—T2-3 Joy Cat Truck
(C) 1—12BU 500 Volt
(C) 1—8BU As Is or Rebuilt, 500 Volt
(C) 2—8BU As Is or Rebuilt, 250 Volt
(W) 1—8BU 11G, 220/440 Volt AC
(W) 2—Baker Battery Supply Tractors
(C) 1—1224 Goodman Cutter, Rubber Mounted
(C) 1—665 Goodman Cat Mounted Loader
(C) 1—360 Goodman Loader
(W) 4—40 H.P. Acme Self Propelled Air Compressors—Permissible

CONVEYORS

(W) 1—52B 26" Jeffrey Conveyor, 900' center to center
(W) 2—95A 24" Goodman Conveyors, Approximately 500'
(C) 1—MTB 26" Joy Conveyor, 1000' centers, less belt
(W) 8—61AM Jeffrey Room Chain Conveyors
(W) 9—61HG Jeffrey Face Chain Conveyors
(W) 2—61EW Jeffrey Elevating Chain Conveyors
(W) 2—61W Jeffrey 15" gathering Chain Conveyors
(W) 4—15" Joy Chain Conveyors, Permissible
(W) 6—G15 Goodman Shaker Conveyors
(W) 6—G12½ Goodman Shaker Conveyors
(W) 1—PT12 Long Piggyback Conveyor

CUTTING MACHINES

(W) 6—11B Sullivans, Both 35 & 50 H.P.
(W) 4—7AU Track Mtd. Sullivans
(W) 1—29C Jeffrey Arc Wall
(C&W) 15—35B & 35BB Jeffrey As Is or Rebuilt
(C) 1—35L Jeffrey
(C&W) 6—12AB Standard Goodman, 35 H.P.
(C&W) 4—12AA Standard Goodman, 50 H.P.
(C) 3—35B, 220/440 Volt Jeffrey
(W) 1—212AA Baby Goodman
(W) 1—212 G3 Baby Goodman 220/440 Volt AC
(W) 1—312 G3, 220/440 Volt AC Goodman
(C) 2—412 CA Goodmans
(W) 4—512 DA Goodmans
(C) 2—712 Goodmans
(C) 1—824 Goodman, 42" t.g.
(C) 1—1224 Goodman, Rubber Mtd., Machine trucks for 12AA, 112AA, 212AA, & 35 B

LOCOMOTIVES

(W) 1—Ironton 4 ton Locomotive, 25" high
(C) 1—MH88 Jeffrey, 42" t.g.
(W) 4—MH68 Jeffrey
(C) 1—MH150 Jeffrey, 42" t.g.
(W) 1—MH12 Jeffrey, 44", or 42"
(C) 1—MH110 Jeffrey, 42" t.g.
(W) 2—MH100 Jeffrey, 36" t.g.
(W) 3—HM803 GE, 36", 42" or 44" t.g.
(W) 3—HM823 GE, 42" t.g.
(W) 1—8-30 Goodman, 4 ton, 25" high, any t.g.
(C&W) 3—3314T Goodman, 6 ton
(W) 1—8 ton Goodman
(W) 1—GE Battery Locomotive, 42" t.g.—Locomotive and batteries are new

MINE CARS

(W) 50—36" t.g. ACF Drop Bottom, Cheap
(W) 13—36" t.g. Sanford Day, Drop Bottom
(C) 20—42" t.g. End Dump—Wood
(W) 30—44" t.g. End Dump—3 Ton Enterprise, All Steel, Excellent
(W) 75—44" t.g. End Dump—2½ Ton Comp. Cars
(W) 85—44" t.g., E.D., 2 ton Enterprise—Composite
(W) 160—44" t.g., E.D., 1½ ton, 23" high—Composite

SUB STATIONS

(W) 1—200KW West. Rotary, 1200RPM, 2300/4000 V. AC. 275 V. DC. Automatic Breakers
(W) 1—150KW West. MG Set, 1200RPM, 2200 Volt, 275 DC
(W) 1—150KW GE, MG Set, 1200RPM, 2200 Volt, 275 DC
(C) 1—150KW West. MG Set, 200 Volt

MISCELLANEOUS

(W) 1—3 track, all steel tipple, located at Iosull, Kentucky
(C&W) 12—HKL Brown Fayro Car Spotting Hoist
(C) 1—Nolan Automatic Car Spotter
(C&W) 12—Hoist—5 to 1000 H.P.
(W) 3—Set Mine Track Scales
(C) 1—Sullivan Air Compressor
(W) 2—Crossover Dumps—New & Used
(W) 6—572 CP Coal Drills
(W) 1—Truck Bed for Stoker Coal—New
(W) 1—Armco prefab steel buildings—130' long
(W) 1—5' Morrow Shaker
(C) 1—42" Loading Boom
(C) 1—48" Loading Boom
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5—200 KW G.E. Rotary Converters, Type HCC-6, Form P, 1200, 250/275 V, complete with switchboards, switchgear, 1200 amp. I-T-E automatic reclosing circuit breakers.
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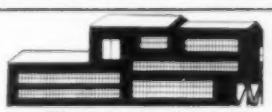

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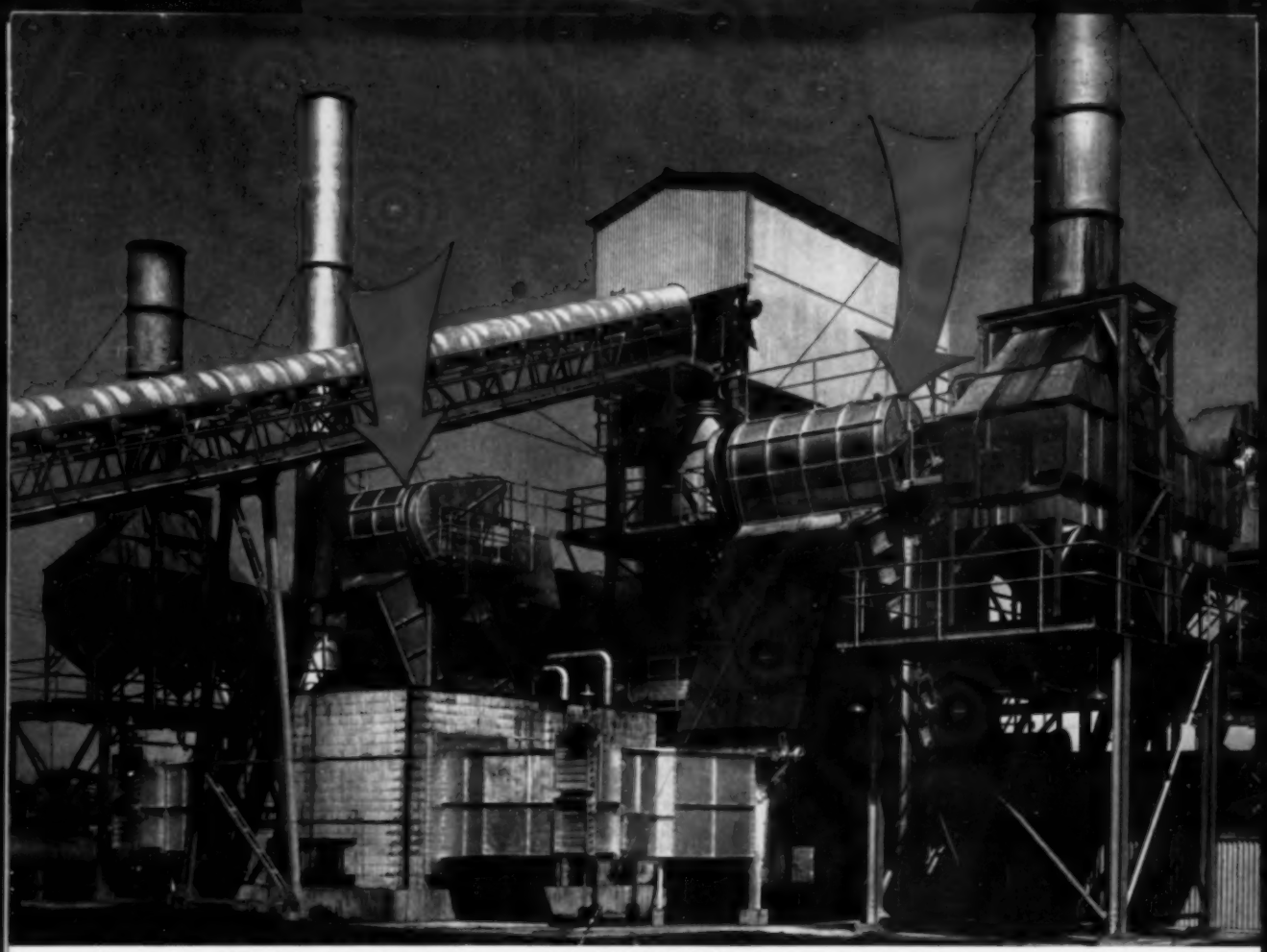

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How LINK-BELT Multi-Louvre dries coal uniformly, gently with

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